STANDARDIZATION ON PURIFICATION PROCESS OF CHERANGKOTTAI

(Semecarpus anacardium-Dried Fruit)

The dissertation Submitted by

Dr.S.SUJITHA,MD(S).

Under the Guidance of

Dr.V.MANJARI,MD(S).

Lecturer, Department of Nanju Noolum Maruthuva Neethi Noolum,

National Institute of Siddha, Chennai-47.

Dissertation Submitted to

The Tamil Nadu Dr. M.G.R. Medical University, Chennai – 32.

For the partial fulfillment of the requirements to the Degree of

DOCTOR OF MEDICINE (SIDDHA)
BRANCH VI - DEPARTMENT OF NANJUNOOLUM MARUTHUVA NEETHI NOOLUM

NATIONAL INSTITUTE OF SIDDHA
Chennai – 47
2014-2017

BONAFIDE CERTIFICATE

Certified that I have gone through the dissertation submitted by D**r. S. SUJITHA** (**Reg No: 321416206)** a student of final year MD (S) Branch VI**, Department of Nanju Noolum Maruthuva Neethi Noolum,** National Institute of Siddha, Tambaram Sanatorium, Chennai – 47 and the dissertation work has been carried out by the individual only. This dissertation does not represent or reproduce the dissertation submitted and approved earlier.

Place: Chennai-47

Date:

Name and Signature of the Guide,
Lecturer,
Department of Nanju Noolum
Maruthuva Neethi Noolum
National Institute of Siddha,
Tambaram Sanatorium,
Chennai – 47.

Name and Signature of the HOD i/c,
Department of Nanju Noolum
Maruthuva Neethi Noolum
National Institute of Siddha,
Tambaram Sanatorium,
Chennai - 47.

Name and Signature of the Director
National Institute of Siddha
Tambaram sanatorium
Chennai – 47.

DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled **STANDARDIZATION ON PURIFICATION PROCESS OF CHERANGKOTTAI (Semecarpus anacardium-Dried fruit)** is a bonafide and genuine research work carried out by me under the guidance of **Dr. V. Manjari, M.D(S).** Lecturer**,** Department of Nanju Noolum Maruthuva Neethi Noolum, National Institute of Siddha, Chennai -47, and the dissertation has not formed the basis for the award of any Degree, Diploma, Fellowship or another similar title.

Date: Signature of the Candidate

Place: National Institute of Siddha,

Chennai (Dr. S.Sujitha)

1. INTRODUCTION

The Siddha System of Medicine is the ancient system contemporaneous with those of submerged lands. The unique nature of this system continuous service to humanity for more than five thousand years in combating disease and in maintaining its physical, mental, and moral health, While many of its contemporaries had completed their courses long long ago, Since it's origin development and ramification have become obscure, any literacy research on this subject, to be scientific and useful should commence with comparative study of the medicine of those ancient civilization which will illuminate many of the dark corners of our system.Tamil Nadu the home of Siddhars was vast continent several millions of years ago. The present Tamil Nadu is only a tiny corner of the extensive continent which once covered the large expanse of the Indian Ocean and beyond.

Generally the Siddhar's are considered to be super human beings who have defined age and other laws of nature to which all human beings are subject too.

The term Siddha would not give a correct picture of the beings its expression when we approach it etymologically. The usage gives several pictures one remove from others by unapproachable distance. So we have to remain satisfied by stringing together several descriptions. In ordinary parlance even magicians and adapts in some of the manual and mental activities are called Siddhars.

The ancient Tamil Siddhars recognize the world as a place filled with all type of individuals at varying level of spiritual evolution. They saw people very close exhausting their karma and even saw some weighted down by the universes reaction to their deeds, based on this wide vision the compassionate Siddha revealed art and science of Medicine, Yoga, Astrology, Practices astronomy and most importantly they documented the eternal wisdom beyond the comprehension of our known world.[1]

Everything is Pancha boothic in nature. Life and death are Panchaboothic which is inevitable. The same process repeats and it will restore in one place called Parabirammam.

Creation, Protection and Destruction are the powers of Parabirammam. The cosmos and the things in cosmos are all Panchaboothic in nature[2].

"பரப்பா பூதமைந்து மண் நீர் தேயு
பரிவாயு வாகாய மைந்தினாலே
சேரப்பா சடமாச்சி..." - (சதக நாடி)

The Panchapootha's are five basic elements:

- Nilam (Matter)
- Neer (Liquid)
- Thee (Heat and energy)
- Vali (Vital air)
- Vinn (The cosmos,space)

Anything which is available in nature should be in the form of

A. Mass.

B. Liquid

C. Heat or Energy

D. Gas

The room for all the four mentioned above is the space. So everything in the universe is aimbootha mayam.

Generally Siddha System does not consider preventive and curative aspects separately but as one for every possible attempt has been made to prevent rather than to cure the diseases. [2]

There is an old saying in Tamil.

"நோயற்ற வாழ்வே குறைவற்ற செல்வம்"

Which means Wealthy life is that which is free from diseases (Health is wealth).The human body is not only to enjoy in the pleasure of the world but also to attain the salvation through various means and hence maintaining the body with good health and strength is the ust. One of the eighteen Siddhars, saint Thirumoolar also stresses the same in Thirumandhiram as

"உடம்பார் அழியின் உயிரார் அழிவர்
திடம்பட மெய்ஞானம் சேரவும் மாட்டார்
உடம்மை வளர்க்கும் உபாயம் அறிந்தே
உடம்பை வளர்தேன் உயிர் வளர்த்தேனே"[3]

Plants have been used in medicinal purposes long before pre historical period. About 8000 herbal remedies have been codified in AYUSH system in India. Ayurveda, Siddha and Unani medicines are the major system of indigenous medicines. Ayurveda and Siddha are most developed and widely practiced in South India [4]. Cherangkottai is one of the herbal drug used in Siddha medicine. Cherangkottai (Semecarpus anacardium) is a herb comes under schedule E drug classification due to it contain toxic alkaloids like Bhilavanol in pericarp and Semecarpol in nut[5]. In Siddha system the Cherangkottai will be used after purification as per Siddha literature.

In Siddha system Cherangkottai and Cherangkottai based medicines use to cure lot of chronic diseases such as Skin diseases, Arthritis, Tuberculosis, Leprosy, Leucoderma, Gastric ulcer, Syphilis, Hemiplegia, all types of Vatha diseases and Various type of Carcinoma. It is one of the main and important drug that is used in many Siddha formulation such as Idivallathy mezhugu, Nanthi mezhgu, Gandhaga rasayanam, Rasaganthi mezhugu, Mahavallathi legium and Cherrangkottai nei and etc [6].

Purification is one of the initial Steps for medicinal preparation. Purification in a chemical context is the physical separation of a chemical substance of interest from foreign or contaminating substance [7]. Purification process in Siddha not only removes the impurities of

the drug. But also reduces toxicity of the drug considerably and enhance the medicinal property of the drug.

The Alternative system of medicine has been banned in number of countries owing to the toxicity due to improper processing of the components and lack of quality control standards. Thus a need arises for the development of reliable standardization tools for effective utility of traditional medicine. According to WHO Herbal standardization is the process of physicochemical evaluation of crude drug covering the aspects such as selection, handling of raw material, safety, efficacy and stability assessment of finished product. Among this standardization of purification process which ensures safety and potency of drug place an important role [(8)]. Standardization of drug means conformation of its quality and purity and detection of nature of adulterant by various parameters like, morphological observation, microscopical observation, chemical observation and physical observation[(9)].

Standardization of Siddha medicine from purification itself is the primary job of Siddha toxicologist. Since now, no scientific validation of changes that occurred during purification process of Cherangkottai carried out. So the author selects standardization of one of the purification process of Cherangkottai as per Siddha literature Gunapadam- part I, Mooligai Vaguppu (page.no:490).

2.AIM AND OBJECTIVES

AIM:

To Standardize the Purification Process of ***CHERANGKOTTAI*** (Semecarpus anacardium-dried fruit).

OBJECTIVES:

1. Collection of Literature review.
2. Authentication of *Cherangkottai*
3. Purify *Cherangkottai* as per Siddha literature.
4. Physicochemical analysis of *Cherangkottai* before and after purification (Sample I&II).
5. Phyto chemical analysis of *Cherangkottai* before and after purification (Sample I&II).
6. To access heavy metal analysis of *Cherangkottai* before and after purification (SampleI&II).
7. Analysis of microbial load of *Cherangkottai* before and after purification (Sample I&II).
8. Evaluate pesticide residues of *Cherangkottai* before and after purification (Sample I&II).
9. To access aflatoxin count in *Cherangkottai* before and after purification (SampleI&II).
10. HPTLC finger print of *Cherangkottai* before and after purification (Sample I&II).
11. To access elemental analysis before and after purification of *Cherangkottai* (SampleI&II).

3.1 சேராங்கொட்டை - Cherangkottai

Semecarpus anacardium. Linn. F

வேறு பெயர்:

சேங்கொட்டை, வல்லாதி, வல்லாதகி, எரிமுகி, பல்லாதகி, கிட்டாக்கனிக்கொட்டை, நந்திவித்து.

Eng. Marking Nut tree, Oriental cashew

Tel. Jeedi - Ginglaa

Mal. Chera

Kan. Ger - Kayl

Sans. Bhallataka - Bijam

Arab. Habukatha

Hind. Bhilawan.

வளரியல்பு வளரிடம் :

இது மர வகையைச் சேர்ந்தது, இந்தியாவில் இமயமலைச் சாரலிலும், வங்காளத்தில் கீழ்ப்பாகத்திலும். இதர வெப்ப நாடுகளிலும் பயிராகும்.

பயன்படும் உறுப்பு:

கொட்டை,

பருப்பு.

சுவை:

கைப்பு,

விறுவிறுப்பு,

தன்மை:

வெப்பம்.

பிரிவு:

கார்ப்பு.

செய்கை:

உடற்றேற்றி - Alterative

புண்ணாக்கி - Caustic

பொதுகுணம்:

இது பெரு நோய், இளைப்பு நோய், நஞ்சுகள், சூலை, இவைகளைப் போக்கடிக்கும், மேலும், திமிர்ப்படை, கருப்புப் படை, வெண்படை (வெண்குட்டம்), தீராக்கடி, வளி நோய்கள், குன்மம் இவைகளையும் விலக்கும்.

குட்டங் கயரோகங் கொல்லும் விடபாகந்
துட்டந் தருகிருமி சூலையும் போம் - மட்டலருங்
கூந்தன்மயி லேகிரந்திக் கூட்டம்போஞ் செங்கையில்
ஏந்துசேங் கொட்டைதனை யே.
(அ.கு.)

சேங்கொட்டை மெய்த்திமிரைத் தீராக கடிவிடத்தைப்
பாங் கொட்டு மூலத்தைப் பற்றறுக்கும் - ஆங்கொட்டிக்
கொல்லும்வா தத்தினொடு குன்மத்தை யும்மதனை
வெல்லும் அயிற்கண்ணாய் விள். (அ.கு)

இ.ன்றியும், இது சொறி, சிரங்கு, புண், கீல், பிடிப்பு, சூலை முதலிய நோய்களையும் போக்கவல்லது.

சேரங்கொட்டையின் சிறப்பு:

- "சேரா தழகு வடிவினுக்குச் சேரு மதிகப் பசியுண்டாம்

  சேங்கன் றென்ன வுரமுண்டாஞ் சேகண்டியைப் போல் தொனியுண்டாம்

  சேட னெனவே யின்பமெலாஞ் சேர்ந்தே அணைய மென்மேலும்

  சேயின் முகம்போல் களையுண்டாம் சேர்க்கே தனன்போல் எழிலுறுமே''. - (தே.க)

  செங்கன்றையொத்த உரம் எழும், செயபேரிகையின் ஒலியைப்போல் குரல் ஒலி பெருகும். ஆதிசேடனைப் போன்று இன்பந்ததுய்க்க வலிவுண்டாம். குழந்தையின் முகம் போல் களையும், மன்மதன் போன்ற எழிலும் உண்டாகும்.
- யாவரும் மெச்சும் இரசத்தால் தீரும் பெரு நோய்களும், இக்கொட்டையில் தீரும்.
- ''காற்பாச மாகக் கடுப்புகா லின்முன்னே

  காற்பாச மாகக் கதறுமே - காற்பாசஞ்

  சேரா விரைக்கற்பஞ் சீராவா மெய்க்கதனாற்

  சேரா விரைக்கற்பந் தின்''.

வளிநோய்களும், அதனாலுண்டாகும் குத்தலும் பெருங்காற்றை எதிர்த்த பஞ்சாகும். காலனுடைய கயிறும் விரைத்து சேரா. உடற்கு மேன்மையையும் அழகும் ஆகும். ஆதலால், "இதனை" கற்பமாகக் கொள்க என்பது முன்னோர் மொழியாகும்.

- இதைத் தக்கபடி தூய்மைப்படுத்தி இதர சரக்குகளுடன் சேர்த்து முடித்த மருந்து பெருமை உடையது.

சேராங்கொட்டை பால்:

சேராங்கொட்டையில் பிசுபிசுப்புள்ள ஒருவித எண்ணெய உண்டு. இக்கொட்டையை நசுக்கி எடுக்ககும் எண்ணெய்க்கு பால் என்று பெயர்.

சேராங்கொட்டை பால் எடுக்கும் முறை

கொட்டையைச் சிதைத்துத் தண்ணீரில் சேர்த்துக் காய்ச்ச, சற்றேறக்குறைய 100- க்கு 32 பங்கு எண்ணெய் தேறும், இரண்டொன்றாய் வெட்டி ஒரு மட்பாத்திரத்தில் போட்டுக் குழித்தைலம் எடுப்பது வழக்கம்.

சேராங்கொட்டை பால் நஞ்சு:

இப்பால் மிகவும் கெட்டது. உடலில் பட்டால் பட்டவிடங்களில் புண் உண்டாகும். சில வேளை இப்புண்கள் மிகத்துன்புறுத்தும். இப்பாலின் வாடை பட்டாலும், பெரும்பாலருக்கு முக வீக்கங் காணுவதும் உண்டு. நீர்கொள்ளும். உடலின் சிறுநீரைக் குறைக்கும், உடல் முழுமையும் சிறு கொப்புளங்களும் உண்டாகும்.

நஞ்சு முறிவு:

இதனாலுண்டாகும், நஞ்சை முறிக்க, புளியிலைக் குடிநீரையேனும் அல்லது தேங்காய்ப்பாலையேனும் உள்ளுக்குக் கொடுக்கலாம். புளி, புங்கு இம்மரங்களின் காற்றுப்பட்டாலும் இதன் நஞ்சு முறியும்[6].

Semecarpus anacardium:

Names in different languages**:**

English name	: Marking nut.
Tamil name	: Chenkottai.
Malayalam name	: Chermara.
Sanskrit name	: Bhallataka.
Telugu name	: Jeetivittulu.
Arabian name	: Beladin.
Gujarati name	: Bhiamu.
Persian name	: Biladur.
Panjabi name	: Bhela.
Marathi name	: Bibba.
Hindi name	: Bhela.

Habitat:

This tree is found growing on the Sub Himalayan and tropical parts of India.

Parts used:

- Fruit (seed).
- Gum.
- Oil.

Taxonomy of Semecarpus anacardium:

Kingdom	: Plantae
Subkingdom	: Tracheobionta.
Super division	: Spermatophyte.
Division	: Magnoliophyta.
Class	: Magndiopsida.
Subclass	: Rosidae.
Order	: Sapindales.
Family	: Anacardiaceae.
Genus	: Semecarpus.
Species	: Anacardiace.

Description:

It is a moderate-sized deciduous tree found in the outer Himalayas and hotter parts of India up to 3500 ft. height. The plant is found in abundance in Assam, Bihar, Bengal and Orissa, Chittagong, central India and western peninsula of East Archipelago, Northern Australia.

It is a medium-to-large size tree, 15–25 m in height with grey bark exfoliating in small irregular flakes, leaves simple alternate, obviate – oblong, 30–60 cm long and 12–30 cm broad, rounded at the apex curvaceous glabrous above and more or less pubescent, beneath. The flowers are greenish white, in panicles and appear with new leaves in May and June, easily recognized by large leaves and the red blaze exuding resin, which blackens on exposure.

The nut is about 2.5 cm long, ovoid and smooth lustrous black. It is frequently found in drier rather than damp localities. The fruit ripens from December to March and are 2–3 cm broad. No specific soil affinity. It is a moderate shade bearer, obliquely ovoid or oblong drupe, 2.5 to 3.8 cm long, compressed, shining black when ripe, Seated on an orange-colored receptacle form of the disk, the base of the calyx and the extremity of the peduncle. The bark is grey in color and exudes an irritant secretion on incising[10].

Phenology:

Flowering season: From May to August**.**

Fruiting season : From August to February.

Seeding Season : From August to February.

Leaf falling : During hot season.

Phytochemistry

The most significant components of the *S. anacardium.* Linn. are

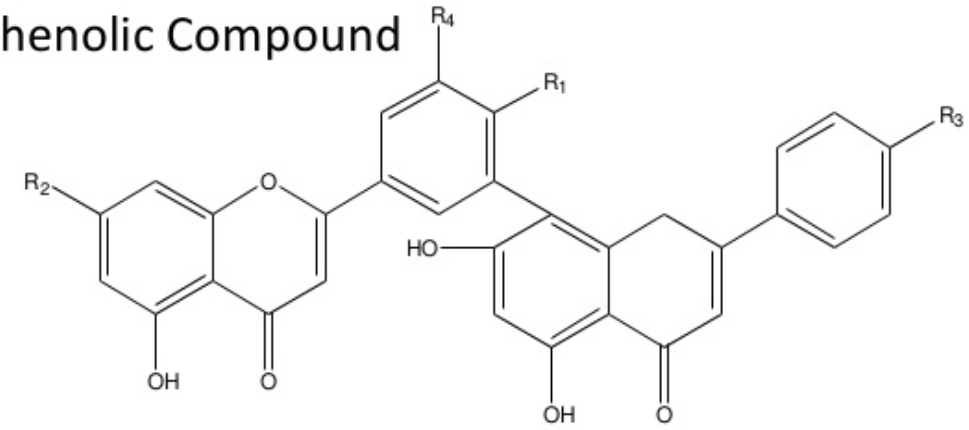
- Bhilwanols
- Phenolic compounds
- Biflavonoids
- Sterols and Glycosides.
- Other components isolated are
- Anacardoside semecarpetin
- Nallaflavanone
- Jeediflavanone
- Semecarpuflavanone
- Galluflavanone
- Anacarduflavone
- Mono-olefin I
- Diolefin II
- Bhilawanol-A, Bhilawanol-B,
- Amentoflavone tetrahydroamentoflavone semicarpol

- Anacardic acid
- Tetrahydrobustaflavone
- O-trimethyl biflavanone A1
- O-trimethyl biflavanone A2
- O-tetramethyl bifl avanone A1
- O-hexamethyl bichalcone A,
- O-dimethyl biflavanone B
- O-heptamethyl bichalcone B1
- O-hexamethyl bichalcone B2
- O-tetramethyl biflavanone C

Structures of Semecarpus anacardium

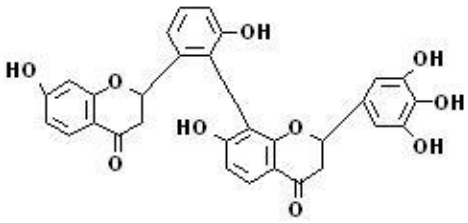
Structures

- Phenolic Compound

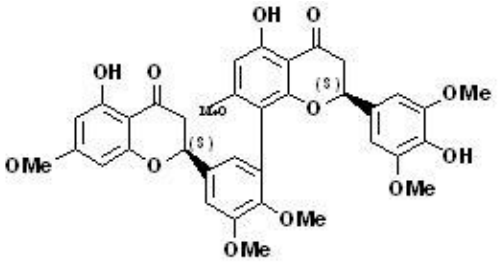


Amentoflavone: $R_1=R_2=R_3=R_4=H$
Bilobetin: $R_1=OCH3$, $R_2=R_3=OH$, $R_4=H$
Ginkgetin: $R_1=R_2=OCH3$, $R_3=OH$, $R_4=H$
Isoginkgetin: $R_1=R_3=OCH3$, $R_2=OH$, $R_4=H$
5'-methyloxybilobetin: $R_1=R_4=OCH3$, $R_2=R_3=OH$
Sciadopitysin: $R_1=R_2=R_3=OCH3$, $R_4=H$

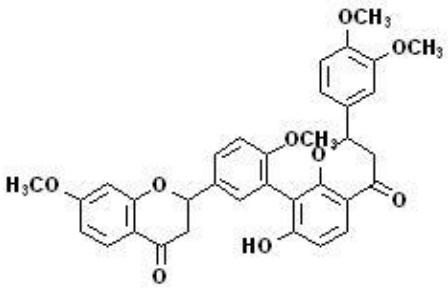
21



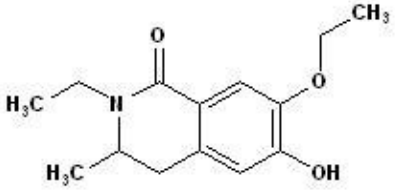
Semacarpuflavanone



Nallaflavanone



Semecarpetin



Anacardol

PHARMACOLOGY:

Anti atherogenic effect

The imbalance between the pro-oxidants and antioxidants is the main cause of development of atherosclerosis. To prevent such condition, antioxidant therapy is beneficial. *Semecarpus anacardium* (SA) shows such antioxidant property. It has capacity to scavenge the superoxide and hydroxyl radicals at low concentrations. The process of atherogenesis initiated by per oxidation of lipids in low-density lipoproteins was also found inhibited by semecarpus anacardium. Cardiac activity of SA, as it generally reduces the tissue and serum hyperlipidemia by the inhibition of intestinal cholesterol absorption coupled with peripheral disposal thus possessing anti-artherosclerotic activity [(11)].

It is possible that the beneficial anti atherogenic effect may be related to its antioxidant, anticoagulant, hypolipidemic, platelet anti-aggregation and lipoprotein lipase releasing properties. The mechanism of hypotriglyceridemic effect has also been shown to be partly due to stimulation of lipoprotein lipase activity.

Anti inflammatory activity

The anti inflammatory effects of SA nut extract on developing and developed adjuvant arthritis. *Semecarpus anacardium* significantly decreased the carrageen an-induced paw edema and cotton pellet granuloma. These results indicate the potent anti inflammatory effect and therapeutic efficacy of SA Nut extract against all phases of inflammation is comparable to that of indo methacin [(12)].The ethyl acetate extract of SA led to the isolation of major active principle, tetra hydroamentoflavone (THA), a biflavonoid. The *in vitro* cyclooxygenase (COX-1)-catalyzed prostaglandin biosynthesis assay of THA gave an IC50 value of 29.5 μM (COX-1) and 40.5% inhibition at 100 g/mL (COX-2). The *in vivo* carrageenan-induced paw edema assay resulted in dose-dependent anti inflammatory effect of THA and the activity was comparable to that of ibuprofen[(13)].

The methanolic, ethanolic, chloroform, ethyl acetate and petroleum ether extracts of fruits of SA and tested to study the anti inflammatory activity using the technique of carrageenan-induced paw edema in albino rats. The extract showed significant anti inflammatory activity comparable to the reference standard aspirin [(14)]. The anti inflammatory activity of Semecarpus

anacardium for both immunological and non immunological origin.The SA extract can inhibit pro inflammatory cytokine production[15].

Crude ethanolic extract of SA nuts was studied for its anti inflammatory activities *in vitro* using peripheral blood and synovial fluid mononuclear cells of healthy individuals and rheumatoid arthritis (RA) patients.

Semecarpus anacardium extract inhibited the spontaneous and LPS-induced production of pro inflammatory cytokines IL-1beta and IL-12p40 but had no effect on TNF-alpha and IL-6 production, both at protein and mRNA level. The crude extract also suppressed LPS-induced nuclear translocation of transcription factors, NF-kappa B and AP-1; the inhibition of NF-kappa B was through the inhibition of I kappa B α phosphorylation. The extract also suppressed LPS-activated nitric oxide production in mouse macrophage cell line, RAW 264.7[16].

For immune modulatory potency, anti oxidative, membrane stabilizing, tumors marker regulative, glucose level restoring and mineral regulation properties of nut extract in hepato cellular carcinoma and found to detoxify a potent Hepato carcinogen aflatoxin B_1 and causes its metabolites to excrete in urine [17]. In other case they explained the therapeutic effects of extract on the changes associated with collagen and glycosaminoglycan metabolism in adjuvant arthritic Wistar rats. Decreased levels of collagen and glycosaminoglycans (GAGS) components (chondroitin sulfate, heparan sulfate, hyaluronic acid) and increase in the levels of connective tissue degrading lysosomal glycohydrolases such as acid phosphatase, beta-glucuronidase, beta-*N*-acetyl glucosaminidase and cathepsin-D observed in arthritic animals were reverted back to near normal levels upon treatment with SA.

The nut milk extract modulates reactive oxygen/nitrogen species levels and anti oxidative system in adjuvant arthritic rats. A significant increase in the levels of lipid peroxides (LPOs), ROS (superoxide radical, hydroxyl radical, H_2O_2 and myeloperoxidase) and RNS (nitrate + nitrite) observed in adjuvant arthritic animals were found to be significantly decreased on administration of the drug at 150 mg/kg body weight/day.

Treatment with SA recouped the altered antioxidant defense components to near normal levels. These evidences suggest that the SA preparations are mainly used for irregularities caused during arthritis and to cure arthritis [18].

Kalpaamruthaa (KA), an indigenous-modified Siddha formulation, consists of SA nut milk extract and fresh dried powder of *Emblica officinalis* (EO) fruit along with honey. Kalpaamrutha was found to be nontoxic up to the dose level of 2000 mg/kg. Further, KA has been reported for its potent antioxidant analgesic, antipyretic and non-ulcerogenic properties. The anti inflammatory activity of SA in adjuvant-induced arthritic rat (AIA) model with reference to mediators of inflammation (lysosomal enzymes) and its effect on proteoglycans. The activities of various enzymes and levels of plasma protein bound carbohydrate components of glycoproteins were determined and were found to be elevated in arthritic rats when compared to control animals [(19)].

Antioxidant activity

Semecarpus anacardium has been reported in various studies to possess potent antioxidant activity. The antioxidant activity of the aqueous extract of nuts of medicinal plant SA in AKR mouse liver during development of lymphoma. Administration of the aqueous extract of SA to lymphoma-transplanted mouse leads to increase in the activities of antioxidant enzymes, whereas LDH activity is brought down significantly indicating a decrease in carcinogenesis[(20)].

The antioxidant activity of ethyl acetate extract of stem bark of SA. Ethyl acetate extract showed the stronger antioxidant activity (due to presence of highest total phenolic content of 68.67% measured as pyrocatechol equivalent) compared to the other (hexane, chloroform and methanol) extracts.

The isolation of the ethyl acetate extract of SA stem bark yielded a bright-yellow solid crystal, which was identified as butein. This compound exhibited antioxidant activity (IC50 values of 43.28 ± 4.34 μg/ml), which was comparable to rutin, taken as a standard[(21)].

CNS activity

The beneficial effect of nuts of SA, extracted with milk, on CNS, mainly for its Locomotors and nootropic activities in different experimental animal models. The extract tested but a slight CNS depressant effect was noted with only 150 mg/kg of the extract and it was found to possess nootropic activity[(22)].

Antimicrobial activity

The aqueous and organic solvent extracts of the plant and screened for antimicrobial (disc diffusion method) and phytochemical properties. The petroleum ether (PEE) and aqueous extract fractions (AQE) showed inhibitory activity against *Staphylococcus aureus* (10 mm) and *Shigella flexneri* (16 mm) at 100 mg/ml, respectively. While chloroform extract showed inhibition against *Bacillus licheniformis, Vibrio cholerae* and *Pseudomonas aeruginosa*, the ethanol extract showed inhibition to *Pseudomonas aeruginosa* and *S. aureus*[23].

The alcoholic extract of dry nuts of SA (Bhallatak) showed bactericidal activity *in vitro* against three gram negative strains (*Escherichia coli, Salmonella typhi* and *Proteus vulgaris*) and two gram positive strains (*Staphylococcus aureus* and *Corynebacterium diphtheriae*). Subsequent studies have shown that the alcoholic extracts of different parts of the plant (leaves, twigs and green fruit) also possess anti-bacterial properties, especially the leaf extract. No derma toxic effect (irritant property) was observed in the mouse skin irritant assay[24].

Hypoglycemic effect

The effect of ethanolic extract of dried nuts of SA on blood glucose and investigated in both normal (hypoglycemic) and streptozotocin-induced diabetic (antihyperglycemic) rats. The ethanolic extract of SA (100 mg/kg) reduced the blond glucose of normal rats. The blood glucose levels were measured at 0, 1, 2 and 3 h after the treatment and antihyperglycemic activity of SA was compared with tolbutamide, a sulfonyl urea derivative used in diabetes mellitus [25].

Kalpaamruthaa (KA), a modified Siddha preparation, which contains Semecarpus anacardium studied for the variations in lipids, lipid-metabolizing enzymes and lipoproteins in cancerous animals and the effect of KA on the lipid metabolism. The increased levels of total cholesterol, free cholesterol, phospholipids, triglycerides and free fatty acids and decreased levels of ester cholesterol in plasma, liver and kidney found in cancer-suffering animals were reverted back to near normal levels on treatment with KA and SA. The effects of KA were found to be more effective than SA[26].

Anti-carcinogenic activity

Semecarpus anacardium nut extract for inhibitory effect on human breast cancer cells (T47D). Cytotoxicity analyses suggested that these cells had become apoptotic. *Semecarpus anacardium* was discovered to induce rapid $Ca^{(2+)}$ mobilization from intracellular stores of T47D cell line, and its Cytotoxicity against T47D was well correlated with altered mitochondrial transmembrane potential. At the molecular level, these changes are accompanied by decrease in Bcl(2) and increase in Bax, cytochrome c, caspases and PARP cleavage, and ultimately by internucleosomal DNA fragmentation.

Taken together, our results provide unprecedented evidence that SA triggers apoptotic signals in T47D cells[27].

The protective efficacy of preparation named as Kalpaamruthaa (KA) (includes SA nut milk extract, dried powder of Phyllanthus emblica fruit and honey) on the peroxidative damage and abnormal antioxidant levels in the hepatic mitochondrial fraction of 7,12-dimethylbenz(a) anthracene (DMBA)-induced mammary carcinoma rats. DMBA-treated rats also showed decline in the activities of mitochondrial enzymes. In contrast, rats treated with SA and KA showed normal lipid peroxidation antioxidant defenses in mitochondrial enzymes, and indicate the anticarcinogenic activity of KA during DMBA-initiated mammary carcinogenesis. On the basis of the observed results, KA can be considered as a readily accessible, promising and novel cancer chemopreventive agent[28].

Restoration of energy metabolism in leukemic mice treated by SA nut milk extract. Leukemia-bearing mice showed a significant increase in LPOs, glycolytic enzymes, a decrease in gluconeogenic enzymes and significant decrease in the activities of TCA cycle and respiratory chain enzymes as compared to control animals. *Semecarpus anacardium* treatment was compared with standard drug imatinib mesylate. *Semecarpus anacardium* administration to leukemic animals resulted in clearance of the leukemic cells from the bone marrow and internal organs[29].

Nephro toxicity:

The toxicity study on a few blood parameters in male albino rats at acute and sub-chronic levels with SA nut oil extract (50% w/v) in ground nut oil. Albino rats (Wistar strain)

were treated orally with three sub-lethal doses. There was a significant decrease in hemoglobin percent and lowering of erythrocytes, indicating 'anemia' during toxicity study.

He also evaluated the acute and sub-chronic effect of crude extract on activity of some kidney enzymes GOT, GPT, SDH, LDH and histology of kidney of albino rat (Wistar strain) in either sex. Significant alteration in activity levels of marker enzymes of kidney as well as histological structure leading to nephritis were observed, indicating renal dysfunctioning in albino rat. Results exhibited nephrotoxicity inducing potential of SA nut oil extract[30].

The antimutagenic effect of SA under *in vivo* condition. Mice were intraperitoneally treated with 500 and 250 mg/kg of SA, which showed a significant inhibition of induced aberrations at the 12 h pretreatment period. The results on the reduction of induced chromosome aberrations clearly show that SA serves as an antioxidant because of the presence of flavonoids which scavenge free radicals.

The action of SA oil extract has definite beneficial role against mitomycin-C induced mutagenicity and its administration may be protective and therapeutic[31].

In this study, the aqueous extracts of medicinal plants were screened for their cytotoxicityusing brine shrimp lethality test. Out of the 120 plants tested, SA (Anacardiaceae) showedsignificant cytotoxicity with LC50 29.5 µg, respectively[32].

சேராங்கொட்டை சேரும் மருந்துகள்:

- **இரச கெந்தி மெழுகு[33]:**

அளவு : ½ முதல் 1 கிராம்.

தீரும் நோய்கள் : பெண்குறி சிலந்தி,
ஆண்குறி சிலந்தி,
மூலம்,
பவுத்திரம்,
ஆண்குறிப்புற்று,
பெண்குறிப்புற்று,
இடிப்புற்று,
கன்னப்புற்று.

- **நந்தி மெழுகு** [34]

அளவு : 200-500 மி.கி.

தீரும் நோயகள்: வண்டுக்கடி,
செய்யான்கடி,
தொழு நோய் -18,
குன்மம் -8,
புற்று, விப்புருதி, கிரந்தி -18,
வெண்குட்டம்,
கருப்பழிவு நோய்,
மார்ப்பாணி,
கால்புற்று.

- **மகாவல்லாதி லேகியம்[35]:**

அளவு : 3கிராம்.

தீரும் நோயகள் : அஸ்தி வெட்டை,
பிளவை, புற்று,
சகல விடங்கள்,

சூலை18, வகைக் குட்டம்,

கை கால் முடக்கு.

- **கந்தக இரசாயணம்[34]**

அளவு : 6 – 12 கிராம்.

தீரும் நோய்கள் மேக நோய்கள்,

வெள்ளை நோய்,

தோல் நோய்,

வெண்குட்டம்,

பூச்சிக்கடிக்கும் கொடுக்கலாம்.

- **சேராங்கொட்டை நெய்[34]:**

அளவு : 10 – 15 துளிகள்

தீரும் நோய்கள்: பற்பல தோல் நோய்கள்,
குட்டம்
இருமல்,
என்புருக்கி நோய்,
இரைப்பிருமல்.

- **இடிவல்லாதி மெழுகு[33]:**

அளவு : 200 மிகி முதல் 1 கிராம்.

தீரும் நோய்கள் : எல்லாவித வாத நோய்கள்,

தொழு நோய்,

குட்டம்

வெள்ளை,

குன்மம்,

சூதக சூலை,

கிரந்தி.

- **விரண சஞ்சிவித் தைலம்[36]:**

அளவு : 6 – 12 கிராம்.

தீரும் நோய்கள்: சகல விரணங்கள்,

வெற்றிலையில் தோய்த்துத் தின்ன சன்னி பாதம் தீரும்.

- **வல்லாதி தைலம்[33]:**

அளவு : ஒரு காசெடை தைலம்.

தீரும் நோய்கள் : 18 சூலை.

- **உரோக சஞ்சீவித் தைலம்[36]:**

தீரும் நோய்கள் : வன்மையான வாதரோகங்கள்,

சந்நிபாதம்,

கோழைவிழும்படியான சுவாச காசரோகம்,

மகாவாத ரோகங்கள்,

கொடிய சுவாச காசரோகங்கள்,

விபரீத சந்நிபாதங்கள்.

- **சதுர் முக சூரணம்[37]:**

அளவு : 1 கிராம்.

தீரும் நோய்கள் : சூலை,

குட்டம்,

கிரந்தி,

மேகம்,

வாயு,

பாண்டு,

சோபை,

சொறி,

விடங்கள்.

- **இரத்திநாகர இரச மெழுகு[38]:**

அளவு : 3 முதல் 4 குன்றி எடை.

தீரும் நோய்கள் : கண்டமாலை,

இலிங்கப் புற்று,

அல்குல் புற்று,

தொடை வாளை,

புரையோடிய புண்கள்,

கால்கை முடக்கு.

- **மேகராசாங்கத்தெண்ணெய்[39]:**

அளவு : வேளைக்கு 1 கரண்டி வீதம்.

தீரும் நோய்கள் : கிரந்தி,

அரையாப்பு,

சூலை,

விப்புருதி கண்டாமாலை,

மேகம்,

பாண்டு.

- **வல்லாதி எண்ணெய[39]:**

அளவு : காசெடை.

தீரும் நோய்கள் : நீலகாசம்,

பீனிசம்,

வாயு சூலை,

முகவாதம்,

மண்டை சூலை.

- **சித்திர வல்லாதி லேகியம்[40]:**

அளவு : கொட்டைபாக்களவு.

தீரும் நோய்கள் : கடி விடம்,

புழுவெட்டு,

குட்டம்,

புற்று

பிளவை,

மேகவாதம் முடக்கு.

- **மதனபூரண வல்லாதி[40]:**

  அளவு : ½ வாராகன்.

  தீரும் நோய்கள் : விந்து கட்டும்.

- **பல்லாதகாதி நெய்[41]**

  அளவு : வேளைக்கு கரண்டி வீதம்

  தீரும் நோய்கள் : பாண்டு,

  கபகுன்மம்,

  கிராணி.

- **அமிர்த நந்தி மெழுகு[42]:**

  அளவு : 1 – ½ குன்றி பிரமாணம்

  தீரும் நோய்கள் : காக்கைவலி,

  அண்டவாதம்,

  சந்தி,

  சுரம்,

  வெண்மேகம்.

- **சீனவல்லாதிமெழுகு[43]:**

  அளவு: நெல்லிக்காய் அளவு ஒரு மண்டலத்திற்கு காலையும் மாலையும் உட்கொள்ளவேண்டும்.

  தீரும் நோய்கள் : குட்டம்,

  மேக நோய்,

  பவுத்திரம்,

  பிளவை,

  புற்று,

  பல வகைப்பட்ட வாத நோய்கள்,

  சூலை.

- **வல்லாதகி இளகம்[44]:**

  அளவு : 1-2 வராகன்.

  தீரும் நோய்கள் : கண்டமாலை,

  குட்டம்,

  சொறி,

  சூலை,

  பவுத்திரம்,

  கால்வெடிப்பு,

  அல்குல் புற்று,

  இலிங்க புற்று.

- **கிரந்தி வல்லாதகி[44]:**

  அளவு : ½-1 வராகன்

  தீரும் நோய்கள் : எல்லாவகை கிரந்தி

  மேக ஊறல்.

- **சூத வல்லாதி உருண்டை[43]:**

  அளவு:

  நாள் ஒன்றுக்கு ஒரு உருண்டை வீதம் ஏழு நாட்களுக்குக் கொடுக்கவும்.

  அளவு: 1-2 வராகன்

  தீரும் நோய்கள் : சூலைக்கட்டு அடியோடு ஒழிந்து விடும்

  கிரந்தி,

  குட்டம்,

  பிளவை,

  விப்புருதி,

  புற்று.

- **வல்லாதி நெய்[45]:**

  அளவு : 1-1 ½ வராகன்

  தீரும் நோய்கள் : பிரமேகம்,

  மேக சூலை,

  நரித்தலை வாதம்,

  சந்து வாதம்,

  கிரந்தி,

  அரையாப்பு,

  முழங்கால் வாதம்.

- **நரசிம்ம இளகம்[44]:**

  அளவு : 1-2 வராகன்

  தீரும் நோய்கள் : கெர்ப்பமேக நோய்

  கரப்பான்,

  குட்டம்,

  கிரந்தி,

  பட்ச வாதம்,

  பாரிசவாதம்,

  பவுத்திரம்.

- **வல்லாதி உருண்டை [45]:**

  அளவு : 3-5 வராகன்

  தீரும் நோய்கள் : மேகம்,

  மேக ஊறல்,

  முத்திரகிரிச்சரம்,

  நீர்கடுப்பு.

- **மகா மேக வல்லாதி[45]:**

  அளவு : 1½ -3 வராகன்

  தீரும் நோய்கள் : தீராத மேக நோய்கள் எல்லாம் தீரும்.

- **வல்லாதி பருப்பு இளகம்[44]:**

  அளவு : 2 -3 வராகன்

  தீரும் நோய்கள் : தலை, மூளையைப் பலப்படுத்தி நரம்புகளை பலப்படுத்தி முறுக்காக்கும்.

- **பால் வல்லாதி[44]:**

  அளவு : 2-4 குன்றி

  தீரும் நோய்கள் : கண்டமாலை,

  குட்டம்,

  சூலை,

  பவுத்திரம்,

  கால்வெடிப்பு,

  அரையாப்பு,

  இலிங்க புற்று.

- **இராமபாணவல்லாதி[44]:**

  அளவு : 3-6 குன்றி

  தீரும் நோய்கள் : மேக சூலை,

  வாதபிடிப்பு,

  பக்க வாதம்,

  அண்ட வாதம்,

  காக்கை வலி,

  தமரக வலி.

- **நீரடிமுத்து வல்லாதி[44]:**

அளவு : 1-2 வராகன்

தீரும் நோய்கள் : மதுமேகம்,

முடக்கு வாதம்,

துடி வாதம்,

அல்குல் புற்று,

இளம்பிள்ளை வாதம்,

வண்டு, எலி செய்யான் கடி நீங்கும்.

- **இராச வல்லாதி[44]:**

அளவு : 1-1 ½ வராகன்

தீரும் நோய்கள் : குடல் வாதம்,

எலும்புக்குள் இருக்கும் வாதம்,

வெண்குட்டம்,

பெருநோய்,

விரைவாதம்,

நரம்பு வாதம்.

- **கெந்தக வல்லாதி[43]:**

அளவு : நெல்லிக்காய் அளவு

தீரும் நோய்கள் : பவுத்திரம்,

இலிங்க புற்று,

ஆண்குறியில் தோன்றும் நோய்கள்,

சீழ்மூலம்,

மண்டை சூலை,

திமிர்வாதம்,

- **புரண வல்லாதி சூரணம்[43]:**

  ஆளவு : அரை கழஞ்சு

  தீரும் நோய்கள் : கொடிய பிணிகள் தீர்ந்து விந்து இறுகும்.

  உடல் வலிமை பெறும்.

- **திலத வல்லாதி[43]**

  அளவு : வெருகடி அளவு

  தீரும் நோய்கள் : எல்லா வகை சூலை,

  கிரந்தி.

3.2.புளி

வேறு பெயர்:

திந்துருணி

ஆம்பிரம்

சிந்தூரம்

சிந்தகம்

எகின்

சிந்தம்

வளரியல்பு:

மரம்

பயன்படும் உறுப்பு:

இலை

ஈர்க்கு

பூ

காய்

ஓடு

கொட்டை

பட்டை

சுவை: புளிப்பு

தன்மை:

வெப்பம்

பிரிவு:

கார்ப்பு

செய்கை:

வெப்பமுண்டாக்கி

குளிர்ச்சியுண்டாக்கி

பித்தடக்கி.

இலையின் குணம்:

அழுபுண்ணை நீக்கும் அடல் சோபை மாற்றும்

எழுபாண்டு வைப்போக்கும் இப்பால்- முழுதும்

அளியச் சிவந்தகண்ணோ யாற்றுங் கனலாம்

புளியிலையை நன்றாய்ப் புகல்

இது அழுகிய புண்

சோகை

பாண்டு

சிவந்த கண்ணோய்

இவைகளை நிக்கும்

உபயோகம்:

புளியிலை ஒரு பங்கு மற்றும் வேப்பிலை ஒரு பங்கு இவ்விரண்டையும் சேர்த்திடித்து 8 பங்கு நீர்விட்டுக் காய்ச்சிப் புண்களைக் கழுவிவர ஆறாத புண்கள் ஆறிப்போகும்.

இலையை நசுக்கி நீர் விட்டுக்கொதிக்கவைத்து கீல் வாயு வீக்கங்களின் மீது பற்றிட வலி தணியும[6].

Tamarinds indica:

Habitat:

This evergreen tree which is indigenous to South India is cultivated throughout India and Burma.

Parts used:

Pulp of the Fruit, Seeds, Leaves, Flowers and Bark.

Constituents:

Pulp contains tartaric acid, citric acid, malic acid and acetic acids, also contains gums and pectin. Seeds contain albuminoids, fat, carbohydrates, fibre and Ash containing phosphorus and nitrogen. Fruit contains trace of oxalic acids.

Action:

- Refrigerant
- Carminative
- Digestive
- Laxative
- Anti scorbutic
- Ant bilious
- Astringent

Uses:

- Poultice of leaves are recommended as applications to inflammatory swellings to relieve pain.
- A gargle of tamarind water is useful in healing pathos sores and sore throats.
- A thick syrup of pulp and leaves boiled will heal up swellings with great heat and burnings.
- Decoction of the leaves used for washing indolent ulcers promotes healthy actions.

- Juice of the leaves warmed by dipping red hot iron is given in dysentery.
- The drug is used in scorpion sting.
- Tamarind leaves are used in herbal tea for reducing malarial fever.
- Tamarind is used as blood purifier.
- Decoction of tamarind leaves is useful in treating jaundice and ulcers.
- Tamarind leaves protects from vitamin deficiency.
- It is a good anti oxidant's.
- Tamarind helps to fight against cancer due to its anti oxidant property.
- Tamarind is used for gastric problem and digestion problem.
- It has cardio protective activity.
- Tamarind improves lactation
- Inhibits genital infections
- Provides relief from menstrual cramps
- Protects the body from infections[46]

3.3.பலாசு

வேறு பெயர்:

புரசு

பிரம தாரு

முருக்கு

கிஞ்சுகி

கிருமி நாசினி

சீரா

பலாசம்

புரைசம்

புரோசு

புனமுருக்கு

வாதபோதம்

வனபத்தியம்

வளரியல்பு:

இம்மரம் இந்தியாவின் மலைபிரதேசங்களில் ஏராளமாக வளரும்.

பயன்படும் உறுப்பு:

இலை

பூ

விதை

பட்டை

பிசின்.

சுவை:

துவர்ப்பு

தன்மை:

வெப்பம்

பிரிவு:

கார்ப்பு.

பூவின் செய்கை:

காமம் பெருக்கி

சிறுநீர் பெருக்கி

தூய்மையாக்கி

குணம்:

புரசுவா தம்பித்தம் பொங்குகபங் குன்மம்

கிருமி யுடனே கிராணி- பெருவலிநோய்

ஒட்டுமதி தீபனத்தை உண்டாக்கு மப்பொழுதே

தீட்டியவேற் கண்ணாய் தெளி.

இது முக்குற்றங்களையும் வயிற்று நோய், வயிற்றுப்புழு, கழிச்சல், உடல் குடைச்சல் ஆகிய இவைகளையும் நீக்கும். பசித்தீயை உண்டாக்கும்.

பயன்கள்:

பூவை நீர் விட்டு வேகவைத்து கட்டிகள் மீது வைத்துக் கட்ட அவை அமுங்கும். விரை வீக்கத்துக்கு இப்பூவை நசுக்கி கொதிக்க வைத்து பற்றிடலாம்.

பூவை வேகவைத்து குடிநீரை வடித்து சிறிது வெடியுப்பு சேர்த்துக் கொடுக்க சிறுநீர் நன்றாக இழியும்[6].

Butea monosperma:

The planet is a moderate sized deciduous tree with bright yellowish red to orange red flowers.

Commonly called "Flame of the forest" found throughout India upto a height of 1250 metre except on acid zones.

Parts used:

Flowers, Seeds, Fruits, Gum, Alkali

Constituents:

Fatty acids (Palmitic acid, Oleic acid, linoleic acid and stearic acid), butrin, isobutrin, coreopsin, palasonin, palasitrin.

Action[10]:

Astringent

Diabetic

Emmenogogue

Depurative

Aphrodisiac

Pharmacological and Biological Studies[4]:

- Antifertility activity
- Anti inflammatory
- Hepato protective
- Anti microbial
- Anti tubercular
- Anti fungal
- Anthelmintic

Toxicity[4]:

Acute toxicity and chronic toxicity studies were carried out. Chronic administration by oral route for 2 months produced marked nephrotoxicity and anaemia. liver, lungs and spleen showed congestion. Stomach showed gross dilatation and chronic inflammation.

The flower extract in a dose of 100-200 ug/kg showed 60% post-coital anti fertility activity in mice[47].

The flower extract affects the spermatogenesis and endocrine function of testes of male house sparrow [47].

Uses[46]

- A decoction of flowers is given in diarrhea and to puerperal women
- The flowers are reported to possess Astringent, Diuretic, Depurative, Aphrodisiac and Tonic properties. These are used as an emmenogogue
- The flower is used as a poultice in orchids and to reduce swellings for bruises and sprains.
- They are effective in leprosy and gout.
- It cures all kind of eye disorders. Control cataract, night blindness etc.
- Stop's nasal bleeding.
- It increases the appetite.
- Used for contraception, it destroys the conceiving ability of women
- It cures swelling of the stomach, caused by indigestion or accumulation of wind.
- It is beneficial in bleeding piles.
- It is an instant and immediate cure for diarrhea.
- It gives relief in joint pain.
- It gives faster relief in wounds.
- It cures all sort of urinary disorder.
- It makes a person healthy, free from any diseases and disorders.
- It is beneficial for curing eczema and itching.

- Tie the poultice of its flower on the tumor. It cures impotency and promoters sexual vigor

3.4 கற்றாழை - **Katrazhai**

Aloe barbadensis, Mill.

வேறு பெயர் - கன்னி, குமரி

Eng.	Indian Aloes, Curacao aloe.
Tel.	Kalabanda
Mal.	Kattuvazha
Kan.	Kathalai gidsa, Lolisara.
Sans.	Kumari
Hind.	Ghikauvar

வளரிடம்:

இ.ந்து இந்தியா முற்றிலும் ஆற்றங்கரைகளிலும் சதுப்ப நிலங்களிலும், தோட்டங்களிலும் பயிராகும்.

வகைகள்:

- சிறுகற்றாழை,
- பெருங்கற்றாழை,
- பேய்கக்கற்றாழை
- கருங்கற்றாழை,
- செங்காற்றாழை.

பயன்படும் உறுப்பு:

பால்,

மடற்சோறு,

சாறு,

வேர்.

சுவை - சிறு கைப்பு,

தன்மை - தட்பம்,

பிரிவு - இனிப்பு.

செய்கை:

உரமாக்கி

உடற்றேற்றி

ருதுஉண்டாக்கி

ருதுவர்த்தினி

பொதுகுணம்:

"பொல்லாமே கங்கபம்பு ழுச்சூலை குட்டரசம்

அல்லார்மத் தம்பகந்த ரங்குன்மம் எல்லாம்விட்

டேகு மரிக்கு மெரிச்சற் கிரிச்சரமு

மாகு மரிக்க மருண்டு".

வாதமேகம், கருமேகம், கிருமிக்குதல், பெருவியாதி, மூலம், உன்மாதம், பகந்தரம், குன்மம், பித்தக்கிரிச்சரம் இவை போம்.

"வற்றாக் குமரிதன்னை வற்றலென வுண்ணினுஞ்சீர்

முற்றாக் குமரியென மூளுமே - நற்றாக்குந்

திண்ணையு மல்லாத் தெரிவையமேயானாலு

முன்மைமிகு நூறாமா யுள்".

(தேரன் வெண்பா).

கற்றாழையை உலர்த்தி முறைப்படி பொடியாகச் செய்து உண்ணில் பொழுதும் இளமையாக வன்மையுடன் நூறாண்டு வாழலாம்.

வழக்கு:

இளமடலுடன், சீரகம், கற்கண்டு சேர்த்தரைத்து, குருதியும் சீதமும் கலந்த

கழிச்சலுக்குக் கொடுக்கலாம்.

மஞ்சள் சிறிது சேர்த்து அரைத்து, ஆரம்ப பீலீக வளர்ச்சிக்கும். கால் அல்லது அரைப்பலம் வரையில் கொடுக்கலாம்.

பேய்க்கற்றாழை

பொதுகுணம்

”பேய்கற்றா ழைக்குப் பெருமேகம் மெய்யெரிச்சல்

ஏய்க்கக்கூட டாஅழலும் ஏகுங்காண் - தாய்க்குநிக

ராஞ்சிவந்த கற்றாழை யங்கங் குளிர்விக்கும்

பாய்ஞ்சயத்தைப் பொன்னாக்கும் பார்”.

பேய்க்கற்றாழைக்கு மிகுநீரும், உடல் எரிவும், கரமும், செங்கற்றாழைக்கு உள்ளழையும் போம். இதனால் இரும்ப தங்கமாகும்.

வழக்கு

கற்றாழையின் சோற்றை எடுத்துப் பல முறை கழுவி, இதில் சிறிது படிகாரம் அல்ல சீனாகற்ண்டு சேர்த்து, சிறு துண்டில் முடிந்து தொங்கவிட அதில் நீர் வடியும், இதைக் கண்களில் விட, கண்ணோய் கண்சிவப்பு, கண்ணருகல் முதலியன மாறும்.

பயன்கள்

- இதனை சாற்றை, வெப்பத்தைத் தணிப்பதற்காகும் பற்பச் செந்தூரங்களுக்குத் துணை கொள்ளலாம். இதுவே பற்ப செந்தூரஞ் செய்யவுமுதவும்.
- இந்தச் சாற்றை வெதுப்பி மாந்த நோய்களுக்கும், ஊழியால் காணும் நீர்வேட்கைக்கும் கொடுக்கலாம்.
- தாபிதங்களுக்கும், வீக்கங்களுக்கும் பூச, அவை தணியும்
- சிறிது அபினி சேர்த்துத் தலைக்குப் பற்றிடத்த தலை நோய் நீங்கும்.
- நல்லெண்ணெய் ஒரெடையாகக் கலந்து காய்ச்சித் தலையில் தடவிவர, தூக்கம் உண்டாகும்.
- வெண்ணெய், கற்கண்டு, வால்மிளகுத்தூள் இவைகளைச் சாற்றுடன் சேர்த்துண்ண நீர்சுருக்கு, உடலரிப்பு, உள்வெட்கை நீங்கும்[6].

Aloea veera:

Habitat:

Cultivated throughout India in many varieties some of which run wild as on coasts of Bombay, Gujarat and South India.

Parts Used

- Leaves
- Fresh juices
- Pulp
- Root

Constituents:

- Aloin ,
- Isobarbaloin,
- Emodin,
- Socaloin,
- Resin

Actions:

- Cooling
- Cathartic
- Laxative
- Tonic

Aloe Vera is rich in

- Calcium
- Sodium,
- Iron,
- Potassium,
- Manganese,

- Zinc,
- Folic acid,
- Vitamins A,B1,B2,B6,C,E, and amino acids[46]

Uses[4]:

- Aloevera is very useful in curing bowel problems due to its high inflammatory properties.
- Reduces inflammation like rheumatism and arthritis
- Applying the gel externally can ease muscle and joint pain
- Stabilizes the alkaline levels of the body
- It is good for constipation.
- Aloe is great in maintaining the cholesterol level by reducing triglycerides.
- Stabilizes the metabolic rate by reducing lipid levels and helps to burn fat and reduce weight.
- It improves oral health and oral hygiene.
- It regulates the blood sugar level.
- It contains high level of anti carcinogenic properties that hinder the growth of tumors
- It boosts up our immune system and self defence mechanism.
- It helps in moisturizing the skin.
- It heals dermatitis, insect bite when applied externally.
- It is rich in proteolytic enzyme which help to remove the dead skin from scalp.
- It helps to maintain the ph balance.
- It helps to heal scalp diseases such as psoriasis and seborrhea.

3.5பசுவின் சாணம்

பொதுகுணம்:

"ஆவினது சாண மடிபடுவீக் கம்முதிரந்

தாவி வருகிருமி சார்ந்தகப- மேவுசுரந்

தங்குந்தா கம்போக்குஞ் சாற்றின்மெய்ச் சுத்தியப்பால்

தெங்கின்பாலுக் கொக்குந் தேர்"

பசுஞ்சாணம் கல் முதலியவைகளால் அடிப்பட்ட வீக்கம் ஒழுகின்ற உதிரம் கிருமி மேகம் கபஞ்சேர்ந்த காய்ச்சல் மிகுந்த தாகம் இவைகளை நீக்கும். தேக சுத்தியுண்டாகும். இது தெங்கின்பாலை ஒக்கும்.

உபயோகம்:

- பசுவின் சாணபால் நேர்வாளம் சேராங்கொட்டை .இவைகளை சுத்தி செய்ய பயன்படுகிறதுது.
- பசுவின் சாணம் கவசம் செய்யவதற்கும் வறட்டி புடமிடவும் பயன்படுகிறது.
- பசுவின் சாணத்தை நீர்விட்டுக் கரைத்துக் கொதிக்க வைத்து பொறுக்ககூடிய சூட்டில் வீக்கத்தின்மேல் பற்றிட விரைவில் அவ்வீக்கம் கரையும்.
- பசுவின்சாணப் பாலைப் பாடணங்களுக்கு முறிப்பாய்ப் பயன்படுத்துகின்றனர்.
- கன்று ஈனாத இளம்பசுவின் சாணத்தைத் துணியிலிட்டுப் பாலெடுத்து உள்ளுக்கு கொடுக்க தேள்கடியினால் உண்டாகும் விடம் இறங்கும் [48]

COW DUNG

Synonyms:

Cow pats, Cow pies and Cow manure.

Action:

Disinfectant

General Property:

- It is used for worm infestations, fever and contusions

- It will strengthen our body
- Property wise it is equivalent to coconut milk

Source:

It is the waste product of animal species. Dung is the undigested residue of plant matter which has passed through the animal gut. The resultant faecal matter is rich in minerals. Colour ranges from greenish to blackish, often darkening soon after exposure to air. Dung may also be collected and used to produce biogas to generate electricity and heat. The gas is rich in methane and is used in rural areas of India and Pakistan and elsewhere to provide a renewable and stable source of electricity. It is one of the best forms of natural fertilizer. Application of cow dung for soil enrichment is an age old agricultural practice which was lost post introduction of chemical fertilizers. Cow dung forms a very important link in chemical free forming. Cow dung is used in producing biogas, a cheap alternative source of energy that can used as a fuel for cooking.

Recent research findings from independent groups in university of Bristol and sage college in Troy, New york, show cow dung to be excellent mood enhancing agent.

Cow dung contains a bacteria mycobacterium vaccae; which activates a group of neurons in brain that produce serotonin – a neuro transmitter that contributes to feelings of well being and happiness[(49).]

Uses:

It is one among the Panchagowiyam and it is used in preparing panchagowiya legium.It is used as antidote.

3.6 Suddhi (Purification)

Purification depicts the uniqueness of Siddha medicine. Purification which is given first and foremost importance rather than any other system of medicine. Detoxification is a common phenomenon for any given drug to increase their therapeutic potency and minimizing the toxicity, Popularly known as "Suddhi muraigal". Thus, no medicinal preparation is done without prior suddhi process [(50)].

Various media used for Purification in Siddha system:

- Water
- Cow's Urine
- Cow's Milk
- Coconut water
- Cow's ghee
- Herbal juices(lemon juice,ginger juice,etc)
- Brick Powder
- Thiripala Decoction
- Hot water
- Goat's milk & urine
- Sour gruel
- Castor oil
- Mother's milk
- Toddy
- Vinegar
- Rice rinced water.

Various method of Purification[(51,52)]

1. Washing
2. Driying
3. Frying

4. Steaming
5. Soaking
6. Boiling
7. Grinding
8. Treating
9. Heating (pudam process,etc)
10. Melting
11. Removing (removal of petiole, bark,etc)
12. Pealing.

Changes occur during purification process [53]:

1. Elimination of physical impurities
2. Organoleptic Changes
3. Changes in hardness
4. Reduction in particle size
5. Reduction in two substance
6. Changes in chemical structure
7. Elemental changes
8. Increasing its pharmacological activity.

4. MATERIALS AND METHODS

4.1. TEST DRUG COLLECTION:

1. *Cherangkottai* was procured and collected from three places.

a.Cherangkottai was procured from K.Ramasamy Chetty Country drug shop, Rasappa street ,Park town ,Chennai on 30.01.2016 and Gopala asan Country drug shop, Nagerkovil,Kanyakumari District on 03.06.2016

b. Cherangkottai was collected from Hilly area of Thakalay in Kanyakumari District on 16.06.2016.

2. Leaf of Puli(*Tamarindus indica*) was collected From Perungattur, Thiruvannamalai District on 10.02.2017

3. Flower of Purasu (*Butea monosperma*) was collected from Mathuranthagam, Kancheepuram Distict on 08.02.2017.

4. Cow dung collected from Agricultural farm, Perungattur Thiruvanamalai District 12.02.2017

5. Kattralai(*Aloe vera*) collected from Perungattur, Thiruvanamalai District on 13.02.2017

4.2. IDENTIFICATION AND AUTHENTICATION:

Cherangkottai, Leaf of Puli, and Aloe vera was identified and authenticated by

Prof .P.Jayaraman Ph.d, Director, Retired professor, presidency college Chennai -5.Registration number of the certificates PARC/2017/3327, PARC/2017/3471 and PARC/2017/3469.

Flower of Purasu (*Butea* monosperma) was identified and authenticated by Dr.D.Aravind MD(S), M.Sc, Assistant Professor, National institute of Siddha, Chennai- 47, Certificate no :NISMB2402016.

4.3. METHOD OF PURIFICATION

Cherangkottai was purified as per standard Siddha literature.

400 gm of Cherangkottai was taken in a mud pot and added one liter of purasu flower decoction then boiled for three hours. After that the Cherangkottai was dried under sunlight. Again the Cherangkottai was boiled with Tamarind leaf decoction, Cow dung mixed water and Katralai juice for three hours respectively. Finally the purified Cherangkottai was dried in sun light and stored in air tight container.

4.4. STANDARDIZATION

Before and after purification of Cherangkottai was considered as Sample I

and Sample II .The following analysis were carried out for standardization of purification process of Cherangkottai as per standard method.

4.4.1. PHARMACOGNOSY STUDY

Collection of specimens

Cherangkottai was collected from hilly area of Thakalay in Kanyakumari district was used for pharmacognosy study. Care was taken to select healthy seeds. The required samples of cherangkottai was fixed in FAA (Farmalin-5ml+ Acetic acid-5ml + 70% Ethyl alcohol-90ml). After 24 hrs of fixing, the specimens were dehydrated with graded series of tertiary –Butyl alcohol as per the schedule given by Sass, 1940. Infiltration of the specimens was carried by gradual addition of paraffin wax (melting point 58-60 C) until TBA solution attained super saturation. The specimens were cast into paraffin blocks.

Sectioning

The paraffin embedded specimens were sectioned with the help of Rotary Microtome. The thickness of the sections was 10-12 μm. Dewaxing of the sections was by customary procedure (Johansen, 1940). The sections were stained with Toluidine blue as per the method published by O'Brien et al. (1964). Since Toluidine blue is a polychromatic stain. The staining results were remarkably good; and some Cytochemical reactions were also obtained. The dye

rendered pink colour to the cellulose walls, blue to the lignified cells, dark green to suberin, violet to the mucilage, blue to the protein bodies etc.

4.4.2. ORGANOLEPTIC EVALUATION

Color

About 2 gm of sample was taken from sample I and sample II in a clean glass beaker and tested for its color by viewing against a white opaque back ground under direct sunlight.

Odor

About 2 gm of sample I and sample II were placed in 100 ml of beaker seperately and tested for its odor by wafting the air above the beaker.

Surface characteristics

Surface characters like texture, fracture were determined for sample I and sample II

Texture: The texture is best examined by taking small quantity of material and rubbing it between the thumb and fore finger. It is usually described as smooth, rough and gritty. Tough of the material determines its softness or hardness.

Fracture: Bend and rupture of sample provides information about brittleness. The appearance of fractured parts give information like whether fibrous, rough, granular etc.

4.4.3. PHYSICO-CHEMICAL ANALYSIS:

The physico-chemical analysis were done at Regional Research Instisute of Unani Medicine, Royapuram, Chennai-13.

The Physico-chemical parameters listed below are useful in establishing quality profile of drug. Physico-chemical parameters were carried out for sample I and II as per WHO guidelines (Anonymous 1998).

Foreign matter

The sample shall be free from visible signs of mould growth, Sliminess, stones, rodent excreta, insects or any other noxious foreign matter when examined as given below. Take a representative portion from a large container, or remove the entire contents of packing if 100gm or less, spread in a thin layer in a suitable dish or tray, Examine in daylight with unaided eye. Transfer suspected particles, if any, to petri dish, and examine with 10x lens in daylight. This should be done for both Sample I and II.

Loss on Drying at 105° C

Take 4gm of sample in a previously weighed 100 ml beaker and heat in oven at 105 °C for 5 hours. Cool the sample in a desicator and weigh it. Repeat the procedure till constant weight is obtained. Calculate the percentage of loss of weight of the sample. It was calculated for sample I and II

Calculation:

$$\text{Percentage loss on drying at 105 °C} = \frac{\text{Loss in weight of the sample}}{\text{Weight of the sample taken}} \times 100$$

Determination of Ash Value

2gms of the Sample I and Sample II were weighed accurately, in a previously ignited and tarred crucible (usually of platinum or silica). Spread the material in an even layer and ignite it by gradually increasing the heat to 500-600 °c until it is white, indicating the absence of carbon. Cool in a desiccators and weigh. If carbon free ash cannot be obtained in this manner, cool the crucible and moisten the residue with about 2ml of water or a saturated solution of ammonium nitrate. Dry on a water bath, then on a hot plate and ignite a constant weight. Allow the residue to cool in suitable desiccators for 30 minutes, and then weigh it without delay. Calculate the percentage of ash with reference of the air dried drug was then calculated.

Calculation:

$$\text{Percentage of total ash} = \frac{\text{Weight of the ash}}{\text{Weight of sample taken}} \times 100$$

Acid – Insoluble Ash

To the crucible containing total ash, 25ml of 1:1 dil. Hcl was added, covered it with a watch glass and boiled gently for 5 minutes. Rinsed the watch glass with 5ml of hot water and added this liquid to the crucible. The insoluble matter on an ashless filter paper was collected and washed it with hot water until the filtrate is neutral. Transfer the filter paper containing the insoluble matter to the original crucible, dried on a hot plate and ignited it to constant weight. Allowed the residue to cool in a suitable desiccators for 30 minutes, then weighed without delay,

the percentage of insoluble ash calculated with reference to the air dried drug. Calculate this for Sample I and Sample II

Calculation:

$$\% \text{ of Acid – insoluble Ash} = \frac{\text{Weight of the ash Acid – insoluble residue}}{\text{Weight of the sample taken}} \times 100$$

Water Soluble Extractive of the Sample

To the Gooch crucible containing the total ash, added 25 ml of water and boiled for 5 minutes. Collected the insoluble matter in a sintered glass crucible for 15 minutes at a temperature not exceeding 450 °C subtract the weight off the insoluble matter from the weight of the ash the difference of the weight represents the water soluble ash. Calculate the percentage of water soluble ash with the reference to the air dried drug for Sample I and Sample II separately.

Calculation:

$$\% \text{ of water soluble extract} = \frac{\text{Weight of the extract}}{\text{Weight of the sample taken}} \times 100$$

Alcohol – Soluble Extractive of the Sample

4gm of the sample weighed accurately in a glass stoppered flask. 100ml of distilled alcohol added to it, shaked occasionally for 6 hours and then allowed to stand for 18 hours. Filter rapidly taking care not to lose any solvent and pipette out 25 ml the filtrate in a pre-weighed 100ml breaker and evaporated to dryness on a water bath. Kept it in an air oven at 105 ◦ C for 6 hours cooled in a desiccators and weighed. The experiment was repeated twice, and takes the average value. Sample I and II were tested individually to find water soluble extractive value.

Calculation:

$$\% \text{ of Alcohol-soluble extract} = \frac{\text{Weight of the ash Acid – insoluble residue}}{\text{Weight of the sample taken}}$$

p^H

The pH of Sample I and II were estimated as per the method prescribed in the Indian Standard (IS) – 6940(1982). One gram of Sample I and Sample II were taken into a 100ml graduated cylinder containing about 50 ml of water and filled up to the mark with water. The cylinder was stopped and shaken vigorously for two minutes and the suspension was allowed to settle for hour at 25 °C to 27 ^{o}C about 25 ml of the clear aqueous solution was transferred into a 50 ml beaker and tested for pH using DIGISUN digital pH meter (DIGISUN electronics, Hyderabed, India).

4.4.4. QUALITATIVE PRELIMINARY PHYTOCHEMICAL TESTS

The test was carried out to identify the organic componunds as per the Harborne JB 1984, Overton KH 1963.

Solvent extract preparation**:** 10 gram of sample I and sample II powder was extracted with 100 ml of organic solvent methanol and kept on a rotatory shakes at 192-220 rpm for 24 hours .the supernatant was collected and solvent was evaporated to make the final volume ¼ of the original volume and stored at 4 celsius in air tight bottles.

S.No	Test	Procedure	Result
1	Flavonoid	A Small quantity of the extract was dissolved in alcohol and treated with magnesium bits and a few drops of concentrated hydrochloric acid and gently warmed.	Appearance of reddish pink or pink colour indicates the presence of flavnoid compound.
2.	Phenol	A Small quantity of the extract was dissolved in alcohol and treated with few drops of 0.1 % alcoholic ferric chloride.	Appearance dark colour as green,blue, bluish green and brown colour indicates presence of phenol.

3.	Alkaloid	**A.**The substance was extracted with 1% aqueous hydrochloric acid and treated with few drops of meyer's reagent. **B.** The substance was extracted with 1% aqueous acetic acid and treated with few drops of Dragendroff's reagent.	A.Formation of cream white or brown precipitate indicates the presence of alkaloid B. Formation of red orange precipitate indicates presence of alkaloid.
4.	Triterpenoid	A small quantity of the extract was treated with tin foil and a few drops of thionyl choloride and gendly warmed.	Formation of reddish pink color indicates the presence of triterpenoid.
5.	Steroid-Libermann Burchard	Few mg of the extract in about 1 ml of chloroform was treated with few drops of acetic anhydride and two drops of concentrated sulphuric acid and gently warmed.	Green or bluish green color indicates the presence of steroid.
6.	Amino acid	A small quantity of the extracted was dissolved in alcohol or water and is treated with few drops of ninhydrin reagent.	Violet or pink color indicates the presence of amino acid.
7.	Coumarin	A small quantity of the extracted was dissolved in alcohol was treated with 5% alcoholic sodium hydroxide.	Appearance of dark yellow color indicates the presence of coumarin.

8.	Glycoside/Sugar-Anthrone sulphuric acid	A small quantity of the extracted was mixed with equal quantity of anthrone in a watch glass and treated with two drops of concentrated sulphuric acid. The mixture was rupped with a glass rod and heated gently on a water bath.	Appearance of dark green color indicates the presence of glycoside.
9.	Tannin	A small quantity of the extracted was dissolved in alcohol or water and is treated with basic lead acetate solution.	Appearance of copious precipitate of the lead salt indicates the presence of tannins.
10.	Quinine	A small quantity of the extracted was dissolved in alcohol was treated with 0.5 % of sodium hydroxide or potassium hydroxide.	Deep coloration as pink, purple and red color indicates the presence of quinonoid compound.
11.	Carboxylic acid	A small quantity of the extracted was dissolved in alcohol and is treated with saturated solution of sodium bicarbonate.	Brisk effervescence due to evolution of carbondioxide indicates the presence of carboxylic acid.
12.	Furanoid	A small quantity of the extracted was treated with dimethlaminobenzaldehyde few drops of concentrated hydrochloric acid. The mixture was heated vigorously on a water bath.	Appearance of pink color indicates the presence of furanoids.

3.	Saponins	The substance was shaken with water in a test tube	Appearance of a permanent lather indicates presence of saponins

4.4.5. TEST FOR HEAVY METAL ANALYSIS:

The procedure recommended for analysis of Heavy metals as per the guidelines WHO (1998) and AOAC (2005).

Instrument details:

Thermo Fisher M Series, 650902 V1.27 model **A**tomic Absorption Spectrometer (AAS) was used for the analysis. The operating parameters:

Lead and Cadmium:

Instrument technique	: Flame technique
Wavelength (Lead)	: 217 nm
Wavelength (Cadmium)	: 228.8 nm
Slit width	: 0. 5 mm
Lamp current (Pb)	: 4.0 mA
Lamp current (Cd)	: 3.0 mA
Carrier gas and flow rate	: Air and Acetylene, 1.1 L/min
Flow rate	: 2 ml/min

Mercury:

Instrument technique	: Cold vapor technique
Wavelength	: 253.7 nm
Slit width	: 0. 5 mm
Lamp current	: 3.0 mA,
Carrier gas and flow rate	: Argon, 1.1 L/min
Flow rate	: 5ml/min

Arsenic:

Instrument technique	: Flame vapor technique
Wavelength	: 193.7 nm
Slit width	: 0. 5 mm
Lamp current	: 6.0 mA,
Carrier gas and flow rate	: Acetylene, Argon, 1.1 L/min
Flow rate	: 5ml/min

The Hallow cathode lamp for Pb, Cd, Hg and As analysis were used as light source to provide specific wavelength for the elements to be determined.

4.4.6. DETERMINATION OF MICROBIAL LOAD

The determination of microbial load as described below was carried out on sample I and sample II as per the WHO guidelines (Anonymous 1998) was done by Regional Research Institute of Unani Medicine, Royapuram, Chennai 13.

Pre-treatment of the test material:

Depending on the nature of the crude herbal material grind, dissolve, dilute, suspend or emulsify it using a suitable method and eliminate any antimicrobial properties by dilution, sterilisation or filtration. Either phosphate buffer p^H 7.0 or fluid medium, used to suspend or dilute the test specimen. Test procedure for the Enterobacteriaceae and certain other Gram-negative bacteria.

Detection of bacteria

Homogenize the pre-treated material appropriately and incubate at 30 - 37°c for a length of time sufficient for multiplication of the organisms. Shake the container, transfer aliquots equivalent to 1 gm or 1ml of the homogenzied material to 100ml of enterobacteria enrichment broth Mosel and incubate at 35 – 37°c for 18 – 48 hours. Prepare a subculture on a plate with culer red bile agar with glucose and lactose. Incubate at 35 - 37°c.

Test Procedure:

Plate Count:

For bacteria use petri dishes 9-10 cm in diameter. To one dish add a mixture of 1ml of the pre-treated herbal material and about 15ml of liquefied cascin-soyabean digest agar at a temperature not exceeding 45°c. Alternatively, spread the material on the surface of the sobdified medium in a petri dish. If necessary, dilute the material to obtain an expected colony count of not more then 300. Prepare two dishes using the same dilution, invert them and incubate them at 30-35°c for 48-72 hours, unless a reliable count is obtained in a short period of time. Count the number of colonies formed and calculates the result using the plate with the largest number of colonies, up to a maximum of 300. For fungi use petri dishes 9-10cm in diameter. To one dish add a mixture of 1ml of pre-treated material and about 15ml of liquefied saborated glucose agar with antibiotics at a temperature not exceeding 45°c alternatively, spread the pre-treated material as described above to obtain are expected colony count of not more than 100. Prepare at least two distinguishing the same dilution and incubate them upright at 20-25°c for 5 days, unless a more reliable count is obtained in a shorter period of time. Count the number of colonies formed and calculates the results using the dish with not more than 100 colonies.

E. coli:

Transfer a quantity of the homogenized material in lactose both prepared and incubated to described above, containing 1g or 1ml of the material being examined to 100ml of MacConkey agar and incubate at 43-45°c for 18-24 hours. Prepare a subculture on plate with MacConkey agar and incubate at 43-45°c for 18-24 hours. Growth of red, generally non-mucoid colonies of Gram-negative rods, sometimes surrounded by a reddish zone of precipitation, indicates the possible of E.Coli. This may be confirmed by the formation of indole at 43.5-44.5°c or by other biochemical reactions. The material passes the test if no such colonies are detected or if the confirmatory biochemical reactions are negative.

Salmonella:

Incubate the solution, suspension or emulsion of the pre-treated material, prepared an described above at 35-37°c for 5-24 hours, as appropriate for enrichment.

Primary test:

Transfer 10 ml of the enrichment culture to 100 ml of tetrachionate bile brilliant broth and incubate at 42-43° for 18 – 24 hours. Prepare subcultures on at least two of the following three agar media citrate agar, xylose, lysine deoxycholate agar, and birllen agar. In culture at 35 – 37° c for 24 – 48 hours.

Secondary test:

Prepare a subculture of any colonies showing the characteristics on the surface of triple sugar iron agar using the deep inoculation technique. This is done by first inoculating the needle and then, incubating at 35 – 37 c for 18 – 24 hours. The test is positive for the presence of salmonella spp. If a change of color from red to yellow is observed in the deep culture (but not in the surface culture), usually with the formation of gas with or without productions on hydrogen sulphide in the agar. Confirmation is obtained by appropriate biochemical and serological tests. The material being examined passes the test if culture of the type described do not appear in the primary test, or if the confirmatory biochemical and serological tests are negative.

Staphylococcus aureus:

Prepare an enrichment culture as described for Pseudomonas aerginosa. Prepare a subculture on a suitable medium such as Baird – parker agar. Incubate at 35 - 37° c for 24-48 hours. The material passes the test if no growth of micro organisms is detected. Black colonies of Gram positive cocci often surrounded by clear zones may indicate the presence Staphylococcus aureus. For catalase-positive cocci, confirmation may be obtained, for exam by coagulase and deoxyribonuclese tests.

4.4.7.ESTIMATION OF PESTICIDE RESIDUES:

Pesticide value of sample I and II was estimated by means of AOAC 2007.01 by GC MS MS/LC MS. Pesticides are usually used in agriculture to increase the yield, improve the quality and to extent the storage life of food crops. These are the deposits of pesticide active ingredients, its metabolites or break down products present in same component of environment after its application, spillage or dumping.

Residue analysis gives the nature and level of chemical contamination with the environment and of its persistence.

Sample preparation:

The acetate buffered Quechers sample preparation method was applied.after homogenization with a house hold mill a15gm portion of the homogenized sample was weighed into a 50 ml polytetrafluro ethylene tube (PTFE) and 100ml of surrogate standard solution in acetonitrile was added followed by 15 ml of aceto nitrile containing 1% acetic acid. Then 6gm of MgSO4 and 2.5 gm sodium acetate trihydrate were added. Then centrifuge the sample at 4000rpm. Then transferred the supernatant and filtered with PTFE filter. Then sample was transferred to auto sample vials and the extracts were evaporated to dryness under a steam of Argon. The analysis done by gas chromatography liquid chromatography coupled to tandem mass spectroscopy with triple quadruple mass analyzers GC MS /LC MS.

4.4.8. TEST FOR AFLATOXIN:

The procedures recommended for the detection of Aflatoxin as per WHO (2007).

Instrument Details:

Name of the Instrument	: CAMAG (CAMAG - Automatic TLC sampler, Scanner and Visualizer)
Spray Gas	: N2
Lamp used	: Deuterium and Tungsten Lamp

The samples were processed as per procedures recommended in WHO 2007 and applied for the Thin Layer Chromatography and High Performance Thin Layer Chromatography study with suitable solvent systems.

After development the plate was allowed to dry in air and examined under UV – 254nm, 366nm and visible light after derivatised using vanillin – sulphuric acid.

4.4.9. HPTLC ANALYSIS:

The procedures recommended for the analysis of TLC and HPTLC analysis as per Wagner H and Bladt S, 1996.

Instrument Details:

Name of the Instrument	: CAMAG (CAMAG – Automatic TLC sampler, Scanner and Visualiser)
Spray Gas	: N2
Lamp used	: Deuterium and Tungsten Lamp

The sample was applied for the Thin Layer Chromatography and High Performance Thin Layer Chromatography study with suitable solvent systems. After development the plate was allowed to dry in air and examined under UV – 254nm, 366nm and visible light after derivatised using vanillin – sulphuric acid.

4.4.10. ELEMENTAL ANALYSIS BY ICPOES:

The following elemental analysis was done at SAIF, IITM, Chennai-36.

A known weight of the sample is 25 mg taken in the Teflon containers. A known 6 ml of concentrated HNO3 and 3 ml of concentrated HCL added and the contents are allowed to react for approximately 5 minute prior to sealing the material the sample is thoroughly filtered paper and the difference in weight is calculated. The sample are preferably stored in plastic container to prevent loss of elements by absorption and quantitatively determinate by PE optima 5200 DV ICPOES vessels. Then it is inserted in separate cabins in the rotar placed in the microware digestion system.

The vessels are then heated to the required temperature. After digestion cooled and made upto a known volume in a standard flask with deionized water.

5. RESULTS

5.1. PHARMACOGNOSY STUDY:

Fruit:

The fruit is a hard elliptical, dark, brown drupe. The pedicel that bears of the drupe is slightly swollen and fleshy forming edible part. The terminal drupe has swollen ridges and furrows in longitudinal plane (Fig1.1). The peri carp is thick and encloses two plane convex cotyledons which are tightly packed inside the fruit (Fig1.2&2.1).

The radical is thick and long. The cotyledons are 1.5mm long and 90 µm thick. The cotyledons consist of thin walled compact parenchymal cells. The epidermis of the cotyledons is unistratose and the cells are squarish and thick walled (Fig 2.2)

Pericarp:

The pericarp is 2.5mm thick. It is differentiated intoEpicarp,Meso carp and Endocarp(Fig 3.1)

Epicarp:

The epicarp consists of vertical pillars of columnar thick walled palisade layer. The palisade layer is 70 µm in height.The palisade layer has dense inclusion of tannin.(Fig 3.1,4.1 &4.2)

Mesocarp:

Inner to the epicarp occurs a thick mesocarp.The mesocarp is differentiated into outer compound parenchymatous zone and innerwide zone of air chambers separated laterally by these wavy partition filaments (Fig 3.2).The parenchymatous mesocarp consists of wide circular parenchymatous. Most of the cells have tanniniferous idioblasts, which are highly dilated circular or elliptical cells. (Fig 4.1.2, Fig 5.1,3).Apart from this tanniniferous cells. These are wide circular oil-cavities (Fig 5.2). The parenchymatous outer mesocarp has several bundles of vascular tissues. The vascular strands are irregular in outline and they include narrow thick walled xylem elements associated with phloem elements (Fig 5.1). The oil cavities and tanniniferous cavities are surrounded by one or two circles of hyaline rectangular thin walled

epithelial cells.(Fig 5The innermost part of the other parenchymatous mesocarp consist of their layer of four or five cells with thick walled fibers extent internally in the form of partition segments between the wide air chambers(Fig 3.1,2,3).

Endocarp:

The endocarp is 600 µm thick. It consist of two zones of narrow, long, this pillars shaped sclerenchyma cells with thicklignified walls. The outer sclerotic endocarp is thinner than inner sclerotic endocarp zone. The sclerotic cells have dark cell contents (Fig 3.1,2).The columnar sclerotic cells are 600µm long and 30µm thick.

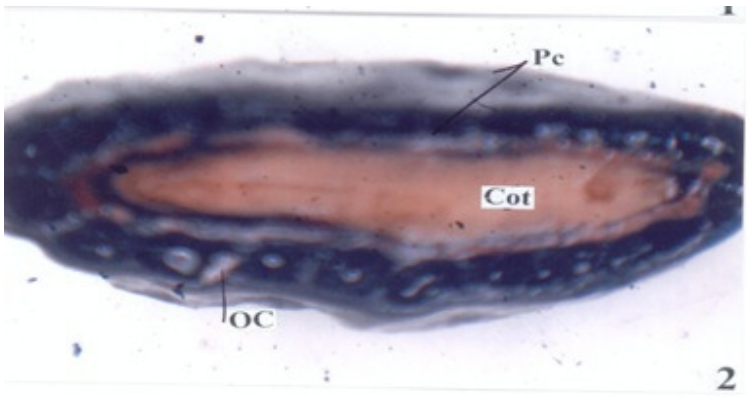
PHARMACOGNOSY RESULT OF CHERRANG KOTTAI DRIED FRUIT

Figure:1

Fig: 1.1. Cherangkottai (Semecarpus anacardium –Dried fruit) Entire View

Fr- Fruit, Sp- Soft pedicle, Gr-Grooves.

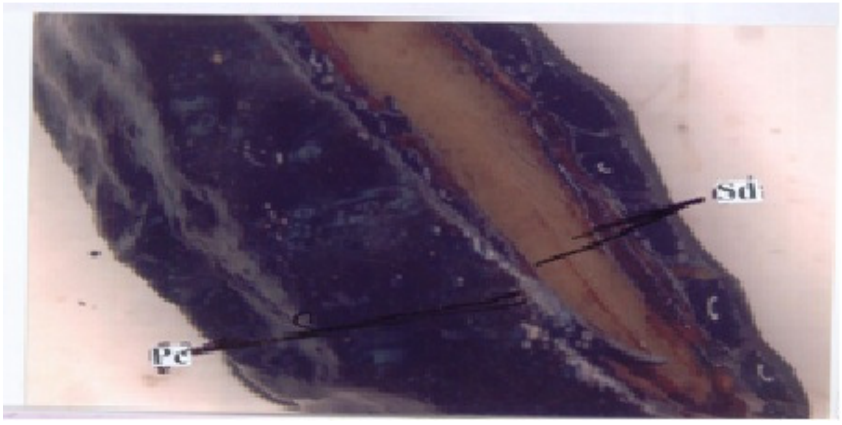
Fig:1.2. Cherangkottai (Semecarpus anacardium –Dried fruit) Inner View-Cross section



Pc- Pericarp, Cot-Cotyledons, Oc- Oil cavity.

Figure:2

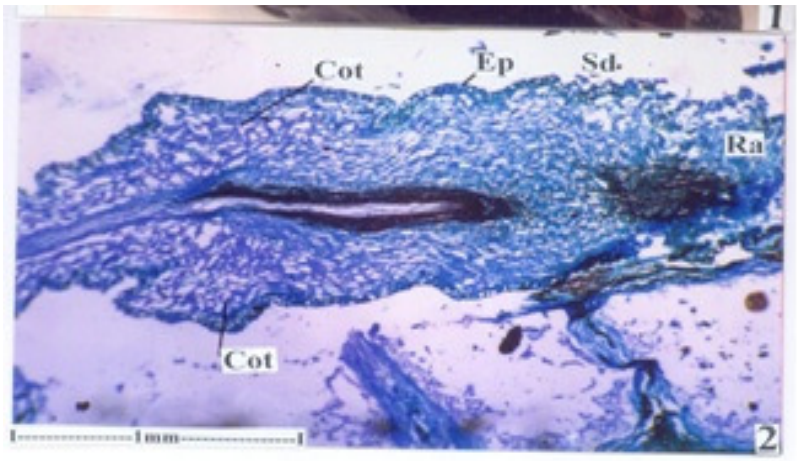
Fig: 2.1 Longituidinal Section of Cherangkottai (Semecarpus anacardium –Dried fruit)



Fr-Fruit, SP-Soft pedicle, Gr-Grooves.

Fig: 2.2 Two cotyledons of the embryo in LS View of Cherangkottai

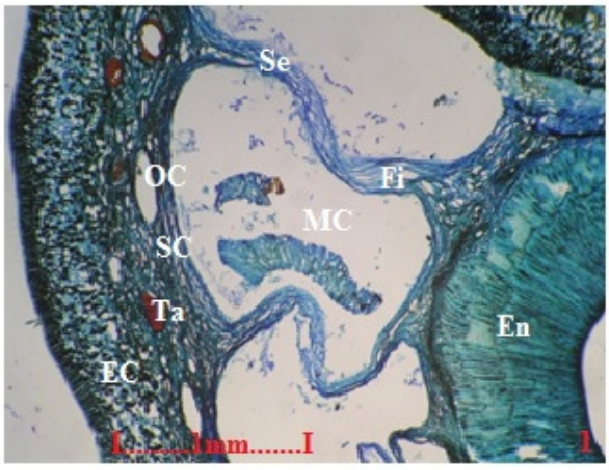
(Semecarpus anacardium seed embryo in 4X View)



Cot-Cotyledons, Ep- E pidermis, Sd-Seed, Ra- Radicle.

Figure :3

Fig:3.1.T S of Cherangkottai (Semecarpua anacardium dried fruit –Apical part)- A Section Enlarged

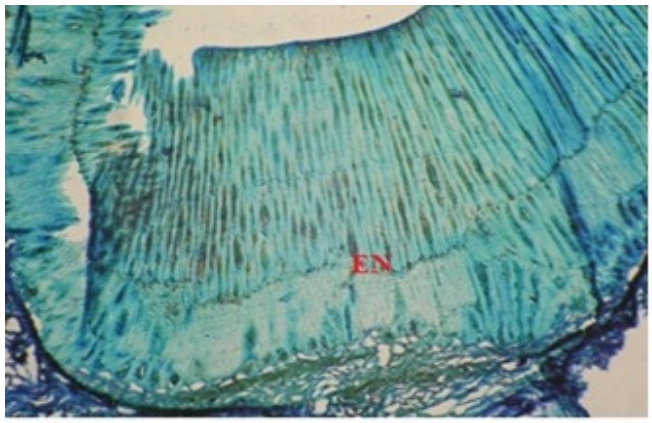


Se-Septum, Oc- Oilcavities, Sc-Scleran chyma, Ta-Tanin,En-Endocarp,

Fi- Partition filament,Mc-Mesocarp.

Fig:3.2. Cherangkottai (Seme carpus anacardium)Seed Coat

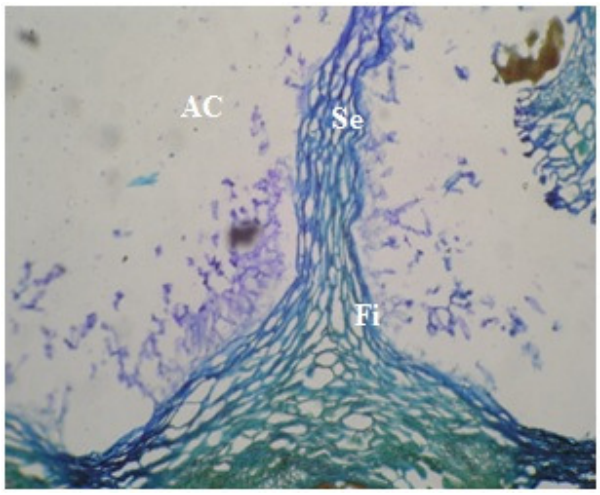
- Inner Part 10X View



EN- Endocarp.

Fig:3.3.Cherangkottai(Semecarpus anacardium) Seed Coat

-Middle part 10X View

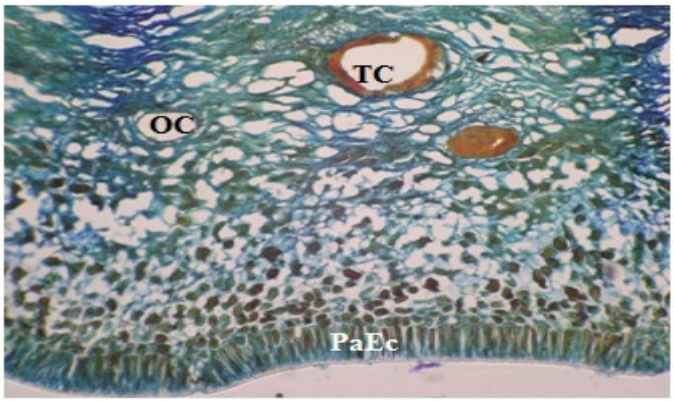


AC-Air chambers, Se-Septum, Fi-Partition Filament.

Figure:4

Fig: 4.1. Cherangkottai (Semecarpus anacardium) Fruit Wall

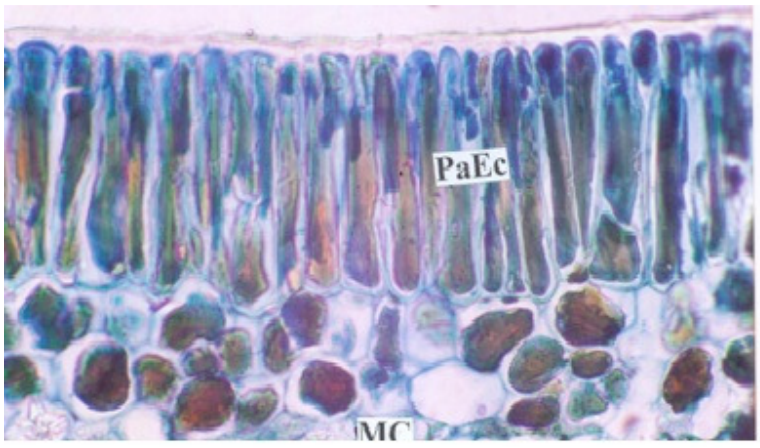
Outer part- 10X View.



TC-Tanin containing cavities,OC-Oil cavities,PaEc- Palisade layer of epicarp.

Fig: 4.2 Cherangkottai (Semecarpus anacardium)

Seed- Epidermis- 40X View

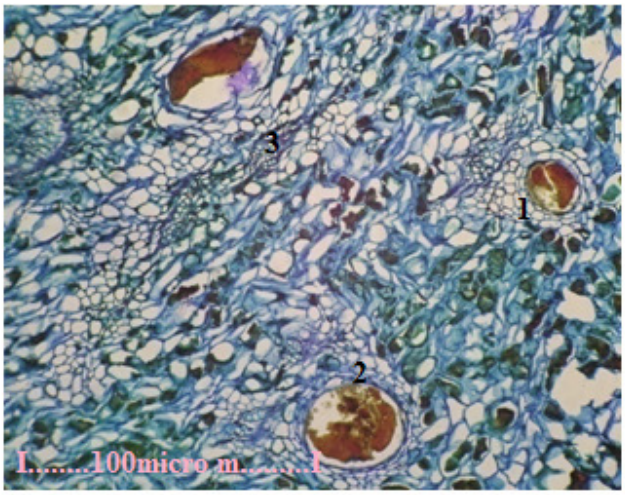


PaEc-Palisade layer of Epicarp, MC-Mesocarp.

Figure:5

Fig: 5.1. Section shows Cavities of Cherangkottai

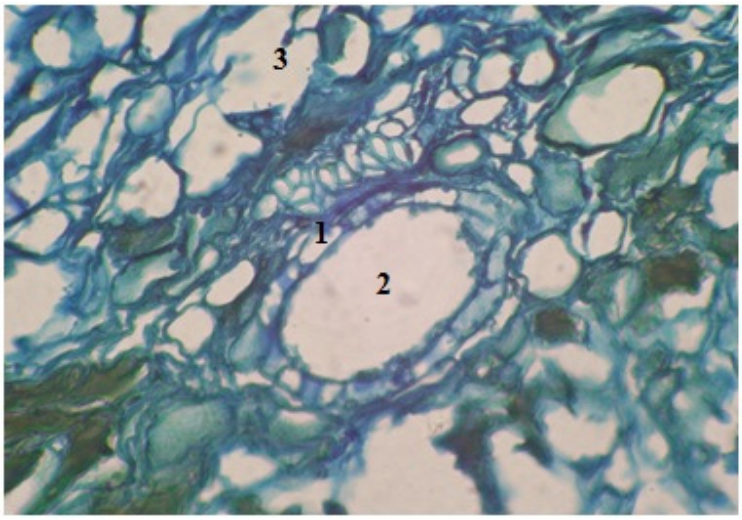
(Seme carpus anacardium-Dried fruit) -10X View



1-Epithelial cells, 2-Tanin containing cells, 3-Vascular strand.

Fig: 5.2. Section Shows Cavity in the outer seed coat of Cherangkottai

(Semecarpus anacardium- Dried fruit)-40X View



1-Epithelial cells, 2-Oil cavity, 3-Vascular strand.

Fig: 5.3. Section shows Tanin sac of Cherangkottai

(Semecarpus anacardium -Dried fruit)- 40X View

1-Tanin containing cells.

5.2. ORGANOLEPTIC EVALUATION:

Table.1: Organoleptic evaluation of Cherangkottai (Semecarpus anacardium-Dried fruit) Sample I&II.

S.NO	Organoleptic Evaluation	Sample I	Sample II
1.	Colour	Light brownish black	Dark black
2.	Odour	Odourless	Odourless
3.	Surface characteristics	Rough and hard	Hardness reduced. Slightly soft than earlier

5.3: PHYSICOCHEMICAL ANALYSIS

Table.2: Result of physico chemical analysis of CHERANGKOTTAI (Semecarpus anacardium –dried fruit) Sample I and II.

S. No.	Parameters	Results	
		Sample -I (Before purification)	Sample –II (After purification)
1	**LOD**	4.93%, 4.97%, 4.98%.	4.90%, 4.92%, 4.94%.
2	**Ash value**		
	a. Total ash (w/w)	3.387%, 3.389%, 3.391%.	2.580%, 2.582%, 2.584%.
	b. Acid insoluble ash (w/w)	0.224%, 0.226%, 0.226%.	0.432%, 0.476%, 0.482%.
3	**Extractive values**		
	a. Alcohol soluble (w/v)	25.73%, 25.75%, 25.78%.	34.16%, 34.18%, 34.24%.
	b. Water soluble (w/v)	6.26%, 6.27%, 6.28%.	6.88%, 6.88%, 6.89%.
4	**pH values (1% solution)**	5.96, 5.98, 5.98.	6.94, 6.95, 5.95.

5.3.PHYTOCHEMICAL ANALYSIS:

Table.3:Result of preliminary phytochemical analysis of CHERANGKOTTAI (Semecarpus anacardium –Dried fruit) Sample I and II.

S. No.	Parameters	Results	
		Sample -I (Before purification)	Sample –II (After purification)
1	**Phenols**	Positive	Positive
2	**Terpenoids**	Negative	Negative
3	**Flavonoids**	Positive	Positive
4	**Alkaloids**	Negative	Negative
5.	**Saponins**	Negative	Negative
6.	**Tannins**	Negative	Negative
7.	**Steroids**	Negative	Negative
8.	**Quinones**	Positive	Positive
9.	**Glycosides**	Positive	Positive
10.	**Amino acids**	Positive	Positive
11.	**Carbohydrates/Sugar**	Positive	Positive
12	**Protein**	Positive	Positive

5.4: HEAVY METAL ANALYSIS

Table.4: Result of Heavy metal analysis of CHERANGKOTTAI (Semecarpus anacardium –Dried fruit) Sample I and II.

S. No.	Heavy metal	Reference Limits as per API- Vol.-I	Results		Remarks
			Sample -I (Before purification)	Sample -II (After purification)	
1	Lead	Not more than 10ppm	**Not detected**	**Not detected**	Within permissible limits
2	Arsenic	Not more than 3.0ppm	**4.002ppb**	**4.090ppb**	Within permissible limits
3	Cadmium	Not more than 0.3ppm	**0.0060ppm**	**0.0032ppm**	Within permissible limits
4	Mercury	Not more than 1.0ppm	**1.362ppb**	**1.012ppb**	Within permissible limits

5.5.MICROBIAL LOAD

Table .5: Result of microbial loads of CHERANGKOTTAI (Semecarpus anacardium – Dried fruit) Sample I and II.

S. No.	Parameters	Reference Limits as per WHO (2007)	Results		
			Sample-I(Before purification)	Sample –II (After purification)	Remarks
1	**Total Bacterial Count (TBC)**	10^5CFU/gm	$2x10^3$cfu/ml	$3x10^3$cfu/ml	Within permissible limits
2	**Total Fungal Count (TFC)**	10^3CFU/gm	Less than 10 cfu/ml	Less than 10 cfu/ml	
3	**Enterobacteriaceae**	10^3	Absent	Absent	
4	***Escherichia coli***	10	Absent	Absent	
5	**Salmonella Spp**	Absent	Absent	Absent	
6	***Staphylococcus aureus***	Absent	Absent	Absent	

5.6. PESTICIDES RESIDUE

Table 6: Result of Pesticides residue of CHERANGKOTTAI (Semecarpus anacardium – Dried fruit) Sample I and II.

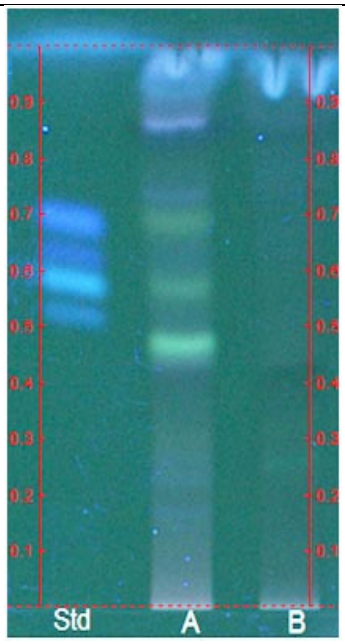
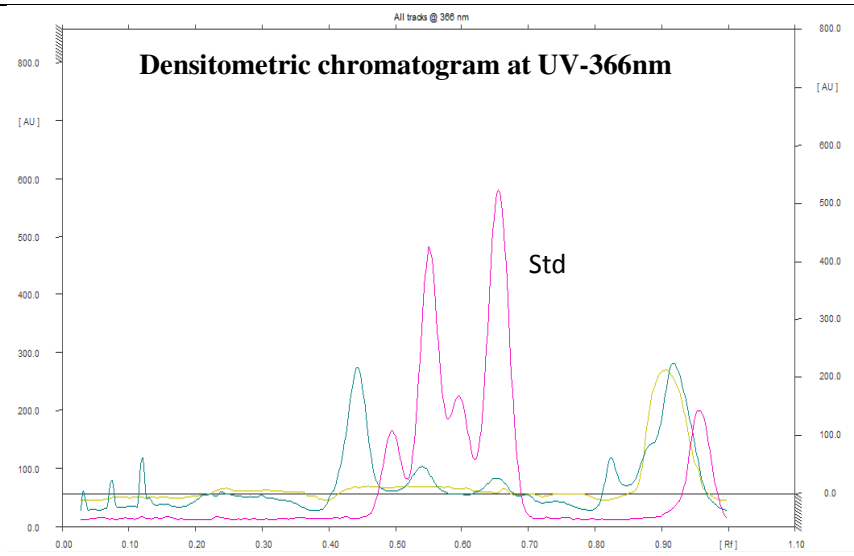
S.NO	Test Parameters	SAMPLE I (Before Purification)	SAMPLE II(After Purification)
Organochlorine Pesticides			
1	Alpha HCH	ND	ND
2	HCB	ND	ND
3	Beta – HCH	ND	ND
4	Gamma – HCH	ND	ND
5	Delta –HCH	ND	ND
6	Heptacholr	ND	ND
7	Aldrin	ND	ND
8	Heptachlor Epoxide	ND	0.514
9	Chlordane (cis & trans)	ND	ND
10	Endosulfan (alpha)	ND	ND
11	Endosulfan sulfate	ND	ND
12	O,p' & p,p'-DD	ND	ND
13	Dieldrin	ND	ND
14	O,p' & DDD	ND	ND
15	Endrin	ND	ND
16	Endosulfan – Beta	ND	ND
17	O,p' & p,p' DDT	ND	ND
18	Methoxychlor	ND	ND
Organophosphorous Compounds			
19	Phorate	ND	ND
20	Methyl parathion	ND	ND
21	Malathion	ND	ND
22	Chlorphyrifos	ND	ND
23	Ethion	ND	ND

5.7. AFLATOXIN ANALYSIS:

Table. 7: Result of Aflatoxin analysis of CHERANGKOTTAI (Semecarpus anacardium – Dried fruit) Sample I and II.

PARAMETER	RESULTS- SAMPLE-I&II
Aflatoxin	
Aflatoxin B1	ND
Aflatoxin B2	ND
Aflatoxin G1	ND
Aflatoxin G2	ND

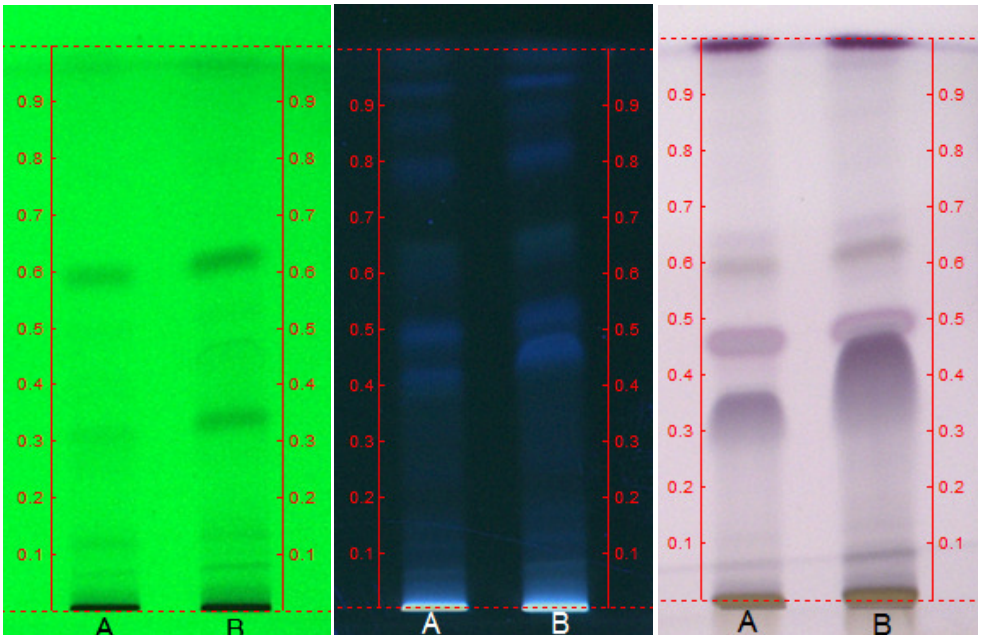
Fig:6

<table>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>UV-366nm</td><td>Standard – G2, G1, B2 & B1
The test sample (A & B) does not show the evidence for the presence of any of the aflatoxins.</td></tr>
</table>

5. 8. RESULT OF TLC/HPTLC ANALYSIS OF CHERANGKOTTAI (Semecarpus anacardium-Dried fruit) SAMPLE II & I

The samples A:After purification and B:Before purification (alcohol extract - each 6µl) were applied in TLC aluminium sheet silica gel 60 F 254 (E. MERCK) and plate was developed using the solvent system Toluene : Ethyl acetate (9 : 1). After development the plate was allowed to dry in air and examined under UV – 254 nm, 366 nm and Visible light (Vanillin –Sulphuric acid)

Fig:7. TLC Photo document –Sample II& I



UV 254 UV366 Visible light

Table: 8. Rf values and colour of major bands of ethanol extract of Cherangkottai (Semecarpus amacardium- Dried fruit) - Sample II .

Solvent system	A-Sample -II (After purification) R_f Values		
	UV 254nm (6 spots)	**UV 366nm (10 spots)**	**VS reagent (5 spots)**
Toluene : Ethyl acetate (9:1)	0.59 Dark green	0.91 Violet	0.62 Violet
	0.49 Green	0.86 Light violet	0.59 Dark grey
	0.40 Green	0.79 Violet	0.48 Grey
	0.30 Dark green	0.61 Blue	0.32 Dark violet
	0.11 Green	0.49 Violet	0.08 Grey
	0.08 Green	0.41 Violet	
		0.39 Light blue	
		0.13 Blue	
		0.11 Blue	
		0.08 Blue	

Table: 9.Rf values and colour of major bands of ethanol extract of Cherangkottai (Semecarpus amacardium- Dried fruit) - Sample I.

Solvent system	B-Sample-I(Before purification) R_f Values		
	UV 254nm (6 spots)	**UV 366nm (9 spots)**	**VS reagent (6 spots)**
Toluene : Ethyl acetate (1:1)	0.60 Dark green	0.93 Violet	0.64 Violet
	0.52 Green	0.89 Blue	0.62 Violet
	0.43 Green	0.81 Violet	0.50 Grey
	0.31 Dark green	0.67 Blue	0.40 Dark violet
	0.11 Green	0.53 Violet	0.12 Grey
	0.09 Green	0.46 Violet	0.07 Grey
		0.14 Blue	
		0.11 Blue	
		0.09 Blue	

Fig:8. Densitometric chromatogram of Cherangkottai (Semecarpus anacardium- dried fruit (Sample - II & I) at 254nm

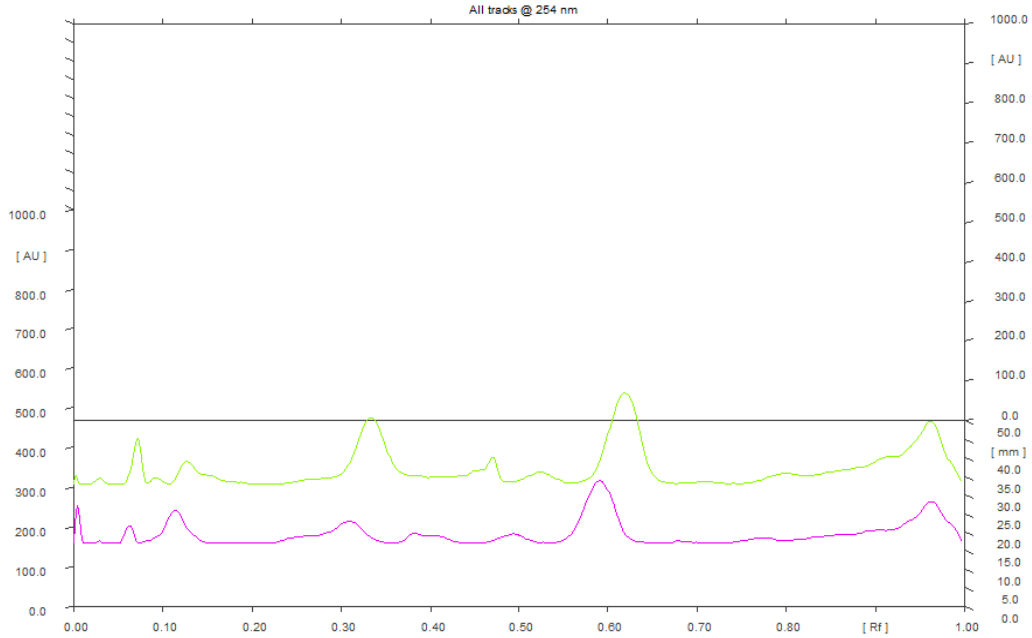


Fig:9. HPTLC finger print of Cherangkottai(Semecarpus anacardium)- Sample – II purified) at 254nm

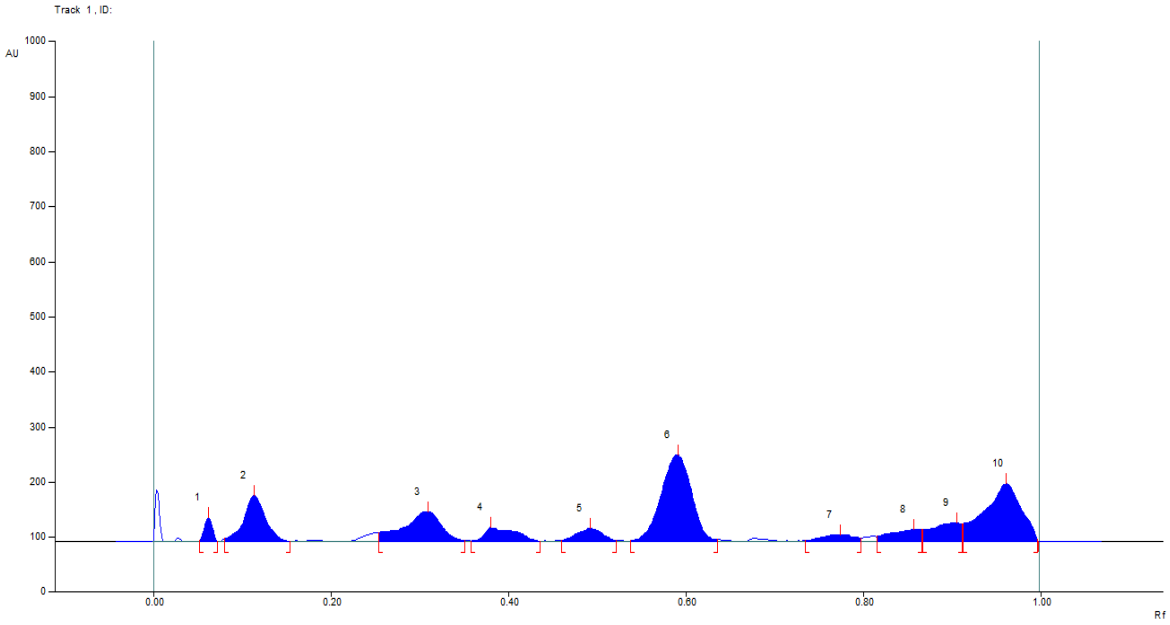


Table:10. Rf value of Cherangkottai (Semecarpus anacardium) (Sample - II) at 254nm

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.05 Rf	1.7 AU	0.06 Rf	43.6 AU	7.76 %	0.07 Rf	1.0 AU	328.3 AU	2.15 %
2	0.08 Rf	5.3 AU	0.11 Rf	83.7 AU	14.90 %	0.15 Rf	0.1 AU	1688.4 AU	11.04 %
3	0.25 Rf	16.4 AU	0.31 Rf	54.3 AU	9.67 %	0.35 Rf	1.7 AU	1923.7 AU	12.58 %
4	0.36 Rf	1.0 AU	0.38 Rf	24.9 AU	4.44 %	0.44 Rf	0.4 AU	726.6 AU	4.75 %
5	0.46 Rf	1.6 AU	0.49 Rf	24.1 AU	4.29 %	0.52 Rf	1.1 AU	568.5 AU	3.72 %
6	0.54 Rf	1.2 AU	0.59 Rf	157.7 AU	28.10 %	0.64 Rf	3.1 AU	4471.0 AU	29.24 %
7	0.74 Rf	1.6 AU	0.77 Rf	12.7 AU	2.27 %	0.80 Rf	6.4 AU	383.9 AU	2.51 %
8	0.82 Rf	9.2 AU	0.86 Rf	21.9 AU	3.90 %	0.87 Rf	21.2 AU	627.3 AU	4.10 %
9	0.87 Rf	21.0 AU	0.91 Rf	33.8 AU	6.03 %	0.91 Rf	32.3 AU	940.3 AU	6.15 %
10	0.91 Rf	32.6 AU	0.96 Rf	104.6 AU	18.64 %	1.00 Rf	4.7 AU	3630.6 AU	23.75 %

Fig :10. HPTLC finger print of Cherangkottai (Semecarpus anacardium)- Sample - I at 254nm

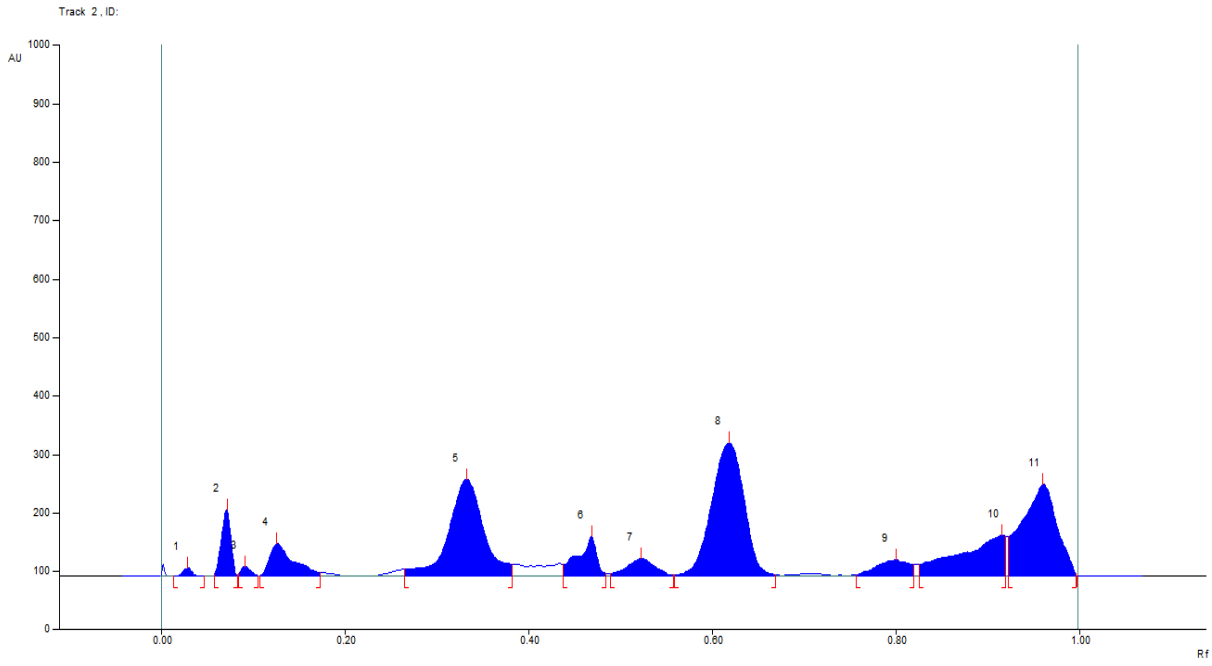


Table.11: Rf values of Cherangkottai (Semecarpus anacardium) -Sample - I at 254nm

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.01 Rf	0.0 AU	0.03 Rf	13.7 AU	1.45 %	0.05 Rf	0.0 AU	101.6 AU	0.41 %
2	0.06 Rf	1.9 AU	0.07 Rf	113.5 AU	12.06 %	0.08 Rf	1.3 AU	968.6 AU	3.89 %
3	0.08 Rf	3.3 AU	0.09 Rf	15.9 AU	1.69 %	0.11 Rf	0.5 AU	140.7 AU	0.57 %
4	0.11 Rf	0.1 AU	0.13 Rf	55.9 AU	5.94 %	0.17 Rf	5.4 AU	1191.1 AU	4.78 %
5	0.27 Rf	11.2 AU	0.33 Rf	164.8 AU	17.52 %	0.38 Rf	20.4 AU	5221.0 AU	20.97 %
6	0.44 Rf	19.3 AU	0.47 Rf	67.3 AU	7.16 %	0.48 Rf	4.4 AU	1130.5 AU	4.54 %
7	0.49 Rf	4.6 AU	0.52 Rf	29.4 AU	3.12 %	0.56 Rf	1.3 AU	740.6 AU	2.97 %
8	0.56 Rf	1.4 AU	0.62 Rf	227.9 AU	24.22 %	0.67 Rf	2.6 AU	6708.4 AU	26.95 %
9	0.76 Rf	2.4 AU	0.80 Rf	27.2 AU	2.90 %	0.82 Rf	19.9 AU	825.5 AU	3.32 %
10	0.83 Rf	19.3 AU	0.92 Rf	69.0 AU	7.33 %	0.92 Rf	68.5 AU	2872.2 AU	11.54 %
11	0.92 Rf	67.9 AU	0.96 Rf	156.3 AU	16.61 %	1.00 Rf	4.1 AU	4994.2 AU	20.06 %

Fig. 11:Densitometric chromatogram of CHERANGKOTTAI Sample II&I at 366 nm-Absorbent mode

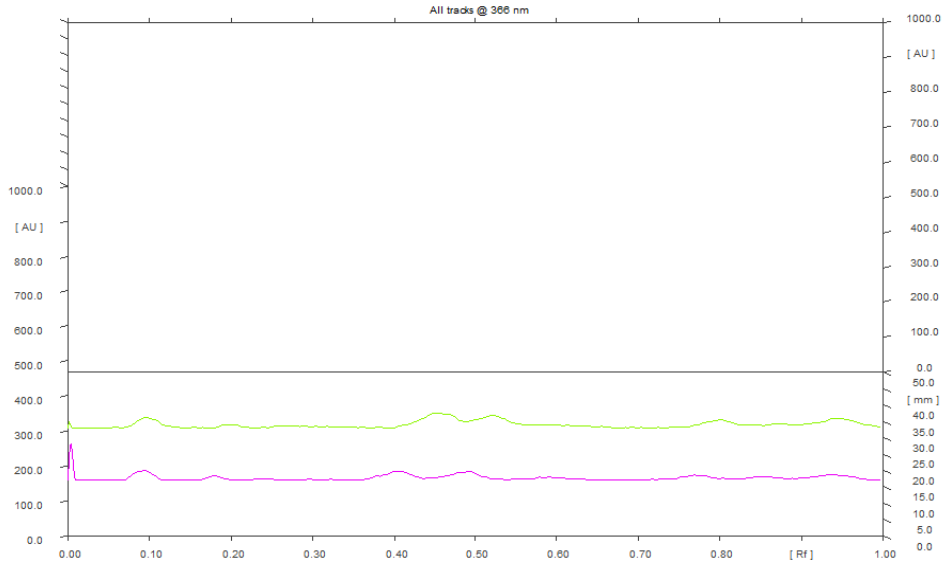


Fig:12.HPTLC Finger print of Cherangkottai SampleII at 366nm-Absorbent mode

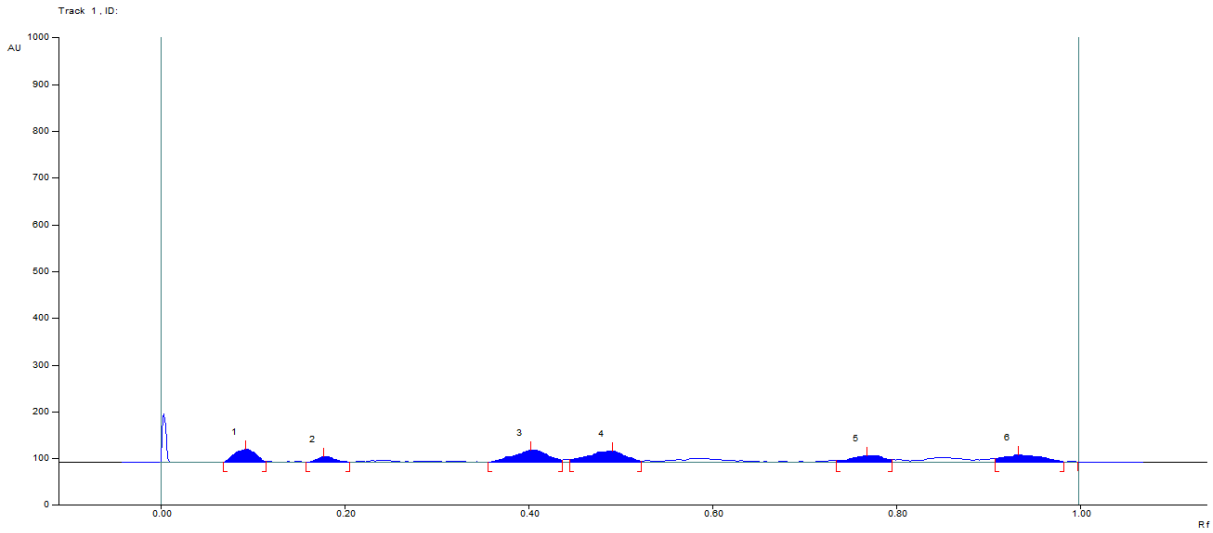


Table.12: Rf values of Cherangkottai (Semecarpus anacardium) -Sample - II at 366nm - Absorbent mode

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.07 Rf	0.9 AU	0.09 Rf	27.9 AU	23.01 %	0.12 Rf	1.3 AU	539.1 AU	16.21 %
2	0.16 Rf	0.1 AU	0.18 Rf	11.9 AU	9.85 %	0.21 Rf	0.5 AU	190.9 AU	5.74 %
3	0.36 Rf	0.4 AU	0.40 Rf	26.2 AU	21.60 %	0.44 Rf	4.5 AU	792.9 AU	23.84 %
4	0.45 Rf	5.5 AU	0.49 Rf	24.3 AU	20.08 %	0.52 Rf	2.4 AU	814.7 AU	24.50 %
5	0.74 Rf	4.4 AU	0.77 Rf	14.7 AU	12.15 %	0.80 Rf	5.5 AU	424.0 AU	12.75 %
6	0.91 Rf	8.0 AU	0.93 Rf	16.1 AU	13.32 %	0.98 Rf	0.5 AU	564.0 AU	16.96 %

Fig:13 HPTLC finger print of Cherrankottai(Semecarpus anacardium) –Sample I at 366nm(Absorbent mode)

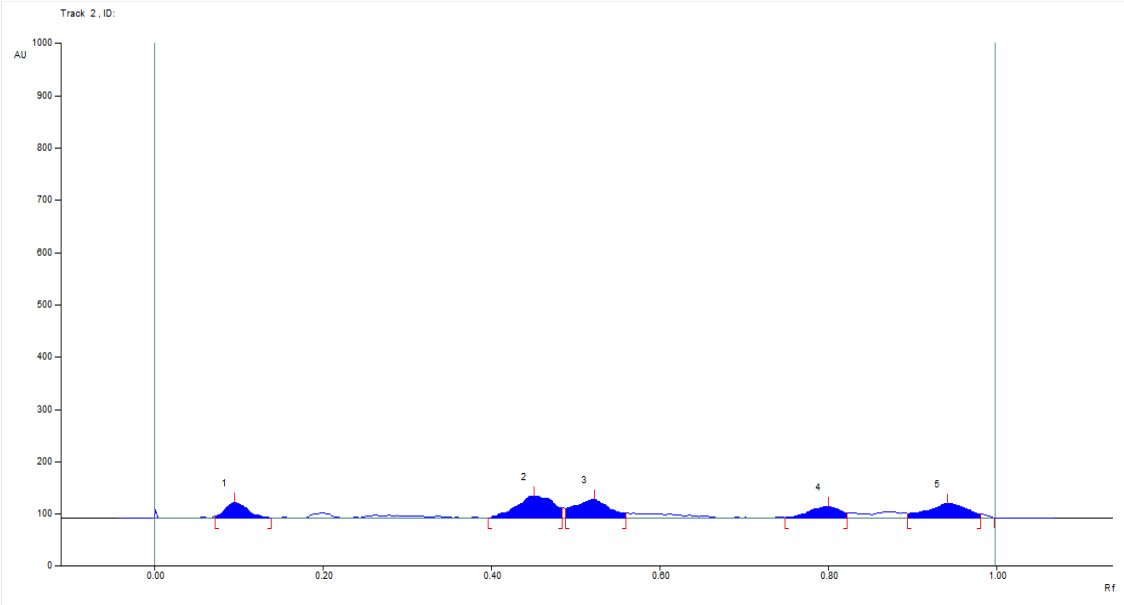


Table: 13. Rf values of Cherangkottai (Semecarpus anacardium) -Sample - I at 366nm - Absorbent mode

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.07 Rf	3.2 AU	0.10 Rf	30.1 AU	18.93 %	0.14 Rf	0.4 AU	660.0 AU	12.69 %
2	0.40 Rf	0.0 AU	0.45 Rf	42.3 AU	26.63 %	0.48 Rf	18.9 AU	1549.7 AU	29.81 %
3	0.49 Rf	18.6 AU	0.52 Rf	35.7 AU	22.50 %	0.56 Rf	9.3 AU	1224.4 AU	23.55 %
4	0.75 Rf	1.0 AU	0.80 Rf	22.7 AU	14.28 %	0.82 Rf	9.7 AU	678.2 AU	13.04 %
5	0.90 Rf	8.9 AU	0.94 Rf	28.1 AU	17.66 %	0.98 Rf	7.2 AU	1086.9 AU	20.90 %

Fig:14.Densitometric chromatogram of Semecarpus anacardium (Sample – II & I) at 366 nm- Flourescence mode

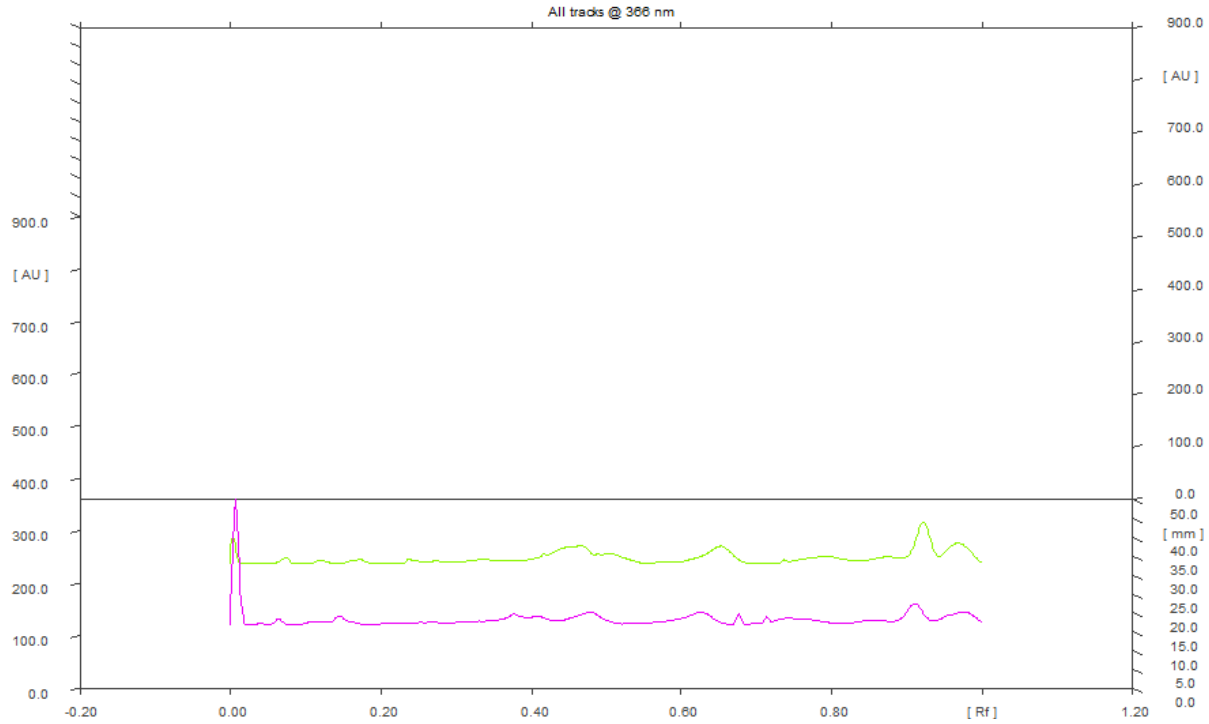


Fig:15. HPTLC finger print of Cherangkottai (Semecarpus anacardium)- Sample II at 366nm(Flouresence mode)

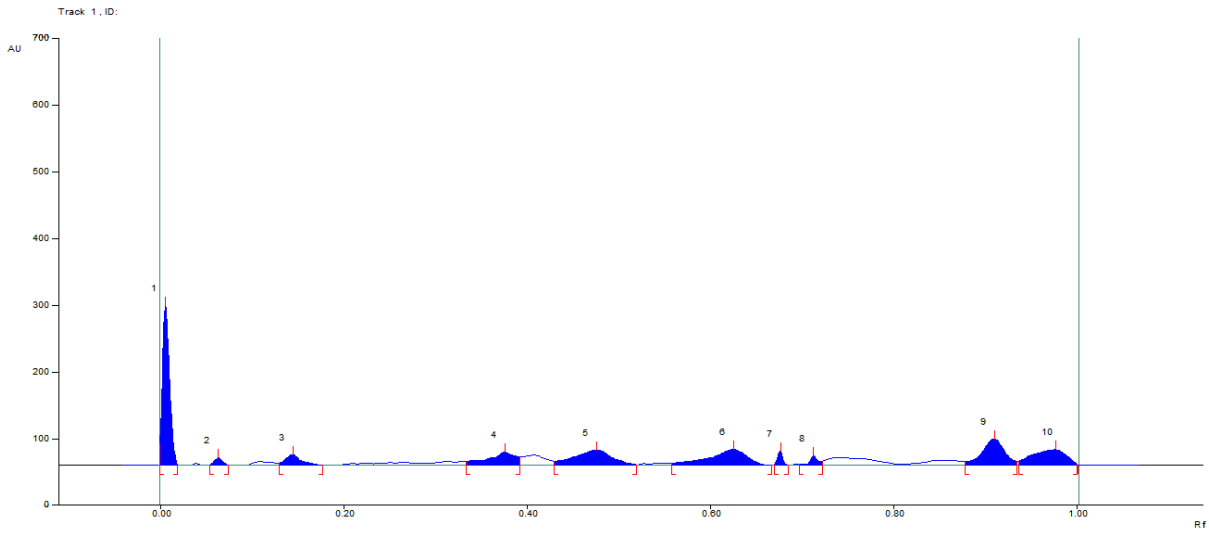


Table. 14: Rf value of Semecarpus anacardium (Sample – II Purified) at 366nm -Flourescence mode

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	31.7 AU	0.01 Rf	239.1 AU	55.77 %	0.02 Rf	0.7 AU	1557.2 AU	27.65 %
2	0.05 Rf	0.3 AU	0.06 Rf	10.6 AU	2.47 %	0.08 Rf	0.2 AU	77.4 AU	1.38 %
3	0.13 Rf	3.4 AU	0.15 Rf	16.0 AU	3.72 %	0.18 Rf	0.0 AU	224.4 AU	3.99 %
4	0.33 Rf	5.3 AU	0.38 Rf	20.1 AU	4.68 %	0.39 Rf	12.6 AU	488.5 AU	8.67 %
5	0.43 Rf	6.1 AU	0.48 Rf	22.4 AU	5.22 %	0.52 Rf	0.5 AU	763.8 AU	13.56 %
6	0.56 Rf	2.5 AU	0.63 Rf	23.6 AU	5.50 %	0.67 Rf	0.1 AU	790.3 AU	14.03 %
7	0.67 Rf	0.7 AU	0.68 Rf	20.3 AU	4.72 %	0.69 Rf	0.0 AU	100.5 AU	1.79 %
8	0.70 Rf	0.8 AU	0.71 Rf	14.3 AU	3.34 %	0.72 Rf	6.1 AU	105.8 AU	1.88 %
9	0.88 Rf	5.3 AU	0.91 Rf	39.3 AU	9.16 %	0.94 Rf	5.9 AU	799.0 AU	14.19 %
10	0.94 Rf	6.2 AU	0.98 Rf	23.2 AU	5.42 %	1.00 Rf	1.1 AU	724.4 AU	12.86 %

Fig:16. HPTLC finger print of Cherangkottai (Semi carpus anacardium) – sample I at 366nm

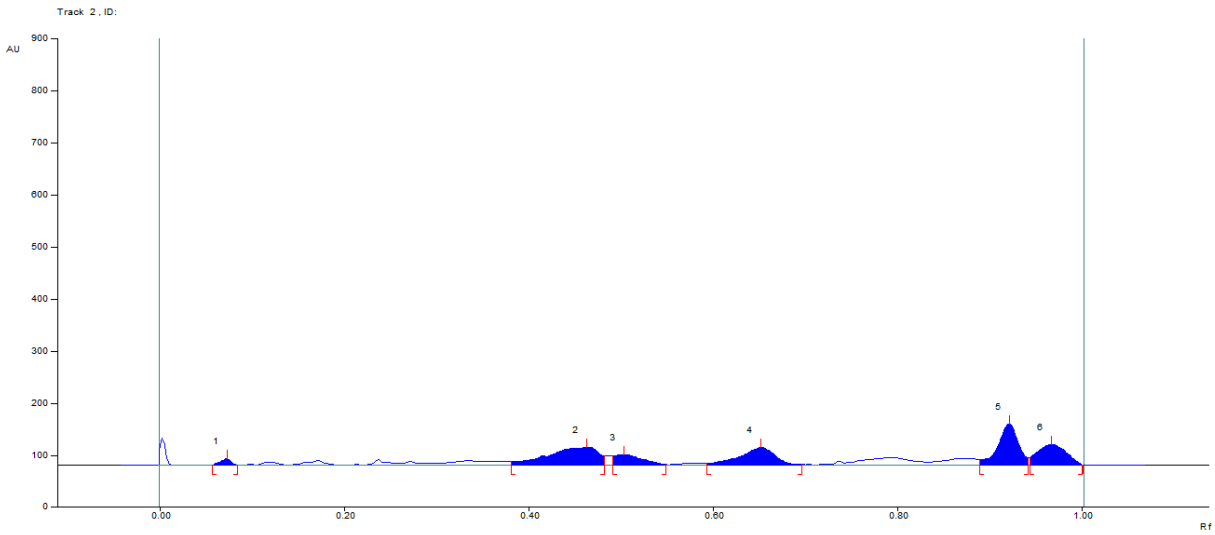


Table:15. Rf of values of Cherangkottai(Semecarpus anacardium) – Sample I at 366 nm (Flourescence mode)

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.06 Rf	0.2 AU	0.07 Rf	12.7 AU	5.75 %	0.08 Rf	0.1 AU	116.5 AU	2.01 %
2	0.38 Rf	6.6 AU	0.46 Rf	34.2 AU	15.54 %	0.48 Rf	17.5 AU	1573.7 AU	27.19 %
3	0.49 Rf	17.5 AU	0.50 Rf	20.3 AU	9.21 %	0.55 Rf	1.1 AU	522.5 AU	9.03 %
4	0.59 Rf	3.3 AU	0.65 Rf	33.6 AU	15.25 %	0.70 Rf	0.9 AU	1073.7 AU	18.55 %
5	0.89 Rf	10.9 AU	0.92 Rf	79.2 AU	35.97 %	0.94 Rf	14.4 AU	1457.0 AU	25.17 %
6	0.94 Rf	14.7 AU	0.97 Rf	40.3 AU	18.28 %	1.00 Rf	0.8 AU	1044.4 AU	18.04 %

Table 16: Result of elemental analysis of CHERANGKOTTAI (Semecarpus anacardium) – Sample I and II.

S.NO	ELEMENTS	WAVE LENGTH in nm	SAMPLE I (Before Purification)	SAMPLE –II (After Purification)
1	Calcium	Ca 317.933	49.32	104.8
2	Magnesium	Mg 285.213	23.37	28.52
3	Sodium	Na 589.592	4.816	70945
4	Nickel	Ni 231.604	0.014	0.006
5	Molybdenum	Mo 202.031	1.371	1.371
6	Phosphorus	P 213.617	0.211	0.828
7	Sulphur	S 181.975	0.340	0.797
8	Potassium	K 766.490	94.48	43.84
9	Cobalt	Co 228.616	0.033	0.034
10	Iron	Fe 238.204	8.798	1.330
11	Selenium	Sc 196.026	0.471	0.516
12	Chromium	Cr 267.716	0.017	0.008
13	Copper	Cu 327.393	3.199	0.374
14	Manganese	Mn 257.610	0.630	0.897
15	Zinc	Zn 206.200	1.293	1.057

6.DISCUSSION

According to WHO, the microscopically and macroscopically description of the medicinal plants is the first step in establishing the identity and the degree of purity of such material.The pharmacognostical parameters are major reliable and inexpensive criteria for confirmation of the raw drugs[54]. Pharmacognosy work was done to find out the botanical characterization of raw drug ***cherangkottai***. On macroscopic examination it appeared hard elliptical, dark brown drupe the terminal drupe has shallow ridges and furrows. Hence the drug was confirmed as semecarpus anacardium.

Transverse section of sample shows epicarp, endocarp, mesocarp. Epicarp contain tannins, mesocarp has air chamber, tanniniferrous cavities idioblast, oil cavities, bundle of vascular tissue, Xylem, phloem and rectangular thin walled epithelial cells. Endocarp contains columnar sclerotic cells. These microscopical appearances suggest the given sample is identified as semecarpus anacardium dried fruit (Fig1.1-5.3).

In morphological examination considerable organoleptic changes occurs in raw sample and purified sample. Before purification it is brownish black in colour after purification it changed to black colour. During process it loses its roughness(Table:1).

Physico chemical is important in identity of a drug[55]. Loss on drying indicates the moisture content. Loss on drying is to determine to measure the amount of water and volatile maters in a sample when the sample is dried in specified conditions. Moisture is one of the major factors responsible for the detoriation of drugs and formulations. Low moisture content is always desirable for higher stability of drug[56]. The percentage of loss on drying of raw drug *Cherangkottai(*Semecarpus anacardium dried fruit) before and after purification was changed from 4.98% w/w to 4.94% w/w.(Table:2) The change in loss or drying from before to after purification process depicts the shelf life of the drug.

Ash values are helpful in determining the quality and purity of crude drugs and herbal medicines especially in the powder form. The total ash content is the measure of inorganic constituents present in the drug. High ash content explains its unsuitable nature to be used as drug. High ash values indicate contamination, adulteration or carelessness in preparing the drug

and less total ash value indicates purity[55]. The total ash value of Cherangkottai for before and after purification process was 3.391% w/w 2.584%w/w respectively(Table:2). The total ash value is much reduced after purification it implies that the inorganic constituents are much reduced after purification. Acid insoluble ash of Cherangkottai(Semecarpus anacardium dried fruit) before and after purification was 0.226%w/w and 0.482% w/w respectively(Table:2).

Extraction value determines the amount of active constituents in a given amount of the formulation when extracted with a solvent media such as alcohol and water [55]. The extract value of water is changed from 6.28% w/w to 6.89%w/w(Table:2) during purification it indicates slight solubility is increased after purification. The extract value of alcohol is changed from 25.78%w/w to 34.24%w/w(Table:2). The alcohol extract value is increased after purification indicates that the alcohol solubility is increased. Hence it is concluded that alcohol is a little better solvent of extraction than water.

The P^H of the raw drug Cherangkottai(Semecarpus anacardium dried fruit) before purification is 5.98 which is acidic. The P^H of the raw drug Cherangkottai(Semecarpus anacardium dried fruit) after purification was changed to 5.95 is also acidic(Table:2). In oral administration the acidic nature of the drug enhances rapid absorption in the stomach[56]. So the medicine prepared from Cherangkottai is suitable for oral administration.

The phytochemicals are chemical compound produced by the plant through primary and Secondary metabolites. Phyto chemicals under research can be classified into major categories such as carotenoids, polyphenols, flavanoids and lignances[57]**.** The phytochemical category includes compounds recognized as essential nutrients which are naturally contained in plants and are required for normal physiological function so must be obtained from the diet in humans[58].

Phenols are the compounds that inhibit oxidation .Higher phenolics in food tend to generate higher anti- oxidant levels. Flavanoids are a group of plant metabolites thought to provide health benefits through cell signaling pathway and anti-oxidant effects. Quinones used as a hydrogen acceptor and oxidant in organic synthesis[59]. Amino acids are fundamental ingredients in the process of protein synthesis. It s involved in the process of structural, metabolic and transport function. Protein when broken down into amino acids used as precursors to nucleic acid ,co-enzyme, hormones, immune response, cellular repair. Protein is needed to form blood cell. Carbohydrates are important in building the cell walls[56].

The phytochemical investigation was performed from sampleI and sample II showed the presence of phenols, flavanoids, quinones, glycosides, amino acids, carbohydrates and proteins(Table:3).These results suggest cherangkottai(semecarpus anacardium dried fruit have antioxidant, anticarcinogenic, anti-inflammatory, anti tumor activity. So the medicine prepared from the cherrangkottai is useful to treat various disease like Skin diseases, Cancer,Hemiplegia, Vadha diseases,(Arthiritis) and Neurological disorders.

As per WHO quantitative analysis is also essential to ensure the heavy metal content. The plant which grow in the soil which are contaminated by some heavy metals such as Lead, Cadmium, Arsenic, Mercury has a high risk of the plant to get absorbed those heavy metals[7]. Hence it is necessary to look for heavy metal analysis. Heavy metal analysis was carried out through AAS method in sample I and II. The Arsenic, Mercury, Cadmium, Lead were within the permissible limits in Sample I & II(Table:4). So Purified Semecarpus anacardium dried seed is safe for preparing medicines and therapeutic uses.

In drugs, the great number of bacteria and fungi thrive due to several reasons like environmental factors, handling, processing and storage. The quality and efficacy of the drug may be decreased due to microbial contamination[60]. The microbial load detected in both purified and unpurified samples(Cherangkottai)(Table:5) is noted that total bacterial count in purified sample is 3×10^3 cfu/ml and 2×10^3 cfu/ml in unpurified sample. Total fungal count is less than 10 cfu/ml in both the samples (as per WHO reference limit 10^3CFU/gm). E.coli, salmonella species, staphylococcus aureus, enterobacteriae are all absent in the both samples. These results shows microbial loads are within permissible limit in Sample I and Sample II.

A pesticides is a substance or a mixture of substance used for killing pests organism dangerous to cultivated plants or animals may leave residues in or on food when it is consumed, those specified derivatives are considered to be toxicological significance[58]. Hence pesticide residue by GCMS/LCMS were studied in cherrangkotai (Sample I &II) revealed the entire absence of all pesticides (Table:6). Analysis of pesticide residue is a parameter for quality control of a drug. These result suggest test sample (sample I&II) have good quality.

Aflatoxins are poisonous carcinogens that are produced by certain molds which grow's in soil,decaying vegetation.it particularly causes liver carcinoma[61]. WHO has emphasized the need for quality assurance of herbal products including testing pesticides residue and aflatoxins[62].The presence of aflatoxin in sample I and sample II analyzed by GCMS(Table:7 & Fig:6). The results shows the entire absence of aflatoxins in both samples.

HPTLC is used in the identification of constituents, identification and determination of impurities and quantitative determination of active substance. It is also an ideal screening tool adulteration. One of the major applications is HPTLC finger print of herbal extract and formulations. Government of India's polices is that quality control of all Ayush product is to be done in HPLTC fingerprint as a primary requirement. The Government of India already published numerous quality guidelines which include such fingerprints. Now all pharmacopeias of the world includes herbal raw material of all them will have to identify by HPTLC in the future[11]. HPTLC analysis was carried out in sample I and sample II

The TLC profile showed 6 major bands under UV 254 nm. 9 major band UV 366nm and 6 clear band after derivatizations in sample I(Table:8).

The HPTLC finger printing pattern at 254 of sample I have 11 spots at RF value 0.03,0.07,0.09,0.13,0.33,0.47,0.52,0.62,0.80,0.92,and 0.96 Rf values indicates the occurrence of atleast 11 different in alcoholic extract(Fig 10 &Table:9) .It is also clear that out of 11 components the components with Rf values 0.62,0.33,0.96,0.922, were found to be more predominant as the percentage area is more with 26.95,20.97,20.06,11.54% respectively. The other peaks were found to be minor as the % area for the peaks were less.

The HPTLC fingerprint pattern at 366 nm (absorbent mode) of sample I have 5 spots at Rf value 0.10,0.45,0.52,0.80 ,and 0.94 Rf value indicates the occurrence of atleast 5 different in alcoholic extract. It is also clear that out of 5 components the component with RF value.0.45,0.52,0.94,0.80,0.10 were found to be more with 29.81,23.55,2 0.90,13.04,12.69 respectively. The other peaks were found to be minor as the % area the peaks were less(Fig:13&Table:12).

The HPTLC finger printing pattern at 366 nm (flouresence mode) of the sample I have 6 spots at Rf value 0.07,0.46,0.50,0.65,0.92,0.97 Rf indicatses the occurrence of at least 6

different in alcoholic extract. It is also clear that out of 6 components the component with Rf value 0.46.,0.92,0.65,0.97, were to be found to be more predominant as the % area is more with 27.19,25.17,18.55,18.04 respectively .The other peaks were found to be minor as the % area for the peaks were less. (Fig:16&Table:15)

The TLC profile showed 6 major bands under UV 254 nm. 10 major bands in UV 366 nm and 5 clear band after derivatizations in sample II(Fig:7). HPTLC fingerprinting pattern at 254 of sample II have 10 spots at Rf values , 0.06,0.11, 0.31,0.38,0.49,059,0.77,0.86,0.and0.96 Rf indicating the occurrence of atleast ten different in alcoholic extract(Fig:9 & Table:10). It is also clear that out of ten components the component with Rf value o.59,0.96,0.31,0.11 were found to be more predominant as the % area is more with 29.24%,20.75%,12.58%,11.04% respectively .the other peaks were found to be minor as the % area for the peaks was less.

The HPTLC fingerprinting pattern at 366nm (absorbent mode)of sample II have 6 spots at Rf value 0.09,0,18,0.40,0.49,0.77&0.93. TheRf indicates the occurrence of atleast 6 different in alcoholic extract (Fig:12 & Table:13). It is also clear that out of 6 components the component with rf value 0.49,0.40,0.93,0.09,0.77,were found to be more predominant as the %area is more with 24.50,23.84,16.96,16.21,12.75respectively .The other peaks were found to be minor as the %area for the peaks were less.

The 3D densitometric chromatogram and the HPTLC finger printing of the alcohol extract of sample I and sample II at 254 &366 nm are shown in Figure8 &11 respectively.

The HPTLC finger printing pattern at 366nm (flurorosence mode)of sample II have 10 spots at Rf value 0.10,0.06,0.15,0.38,0.48,0.63,0.68,0.71,0.91,0.98. Rf indicates the occurrence of atleast 10 different in alcoholic extract(Fig: 15&Table:14). It is also clear that out of 10 component the component with Rf value 0.01,0.91,0.63,0.48,0.98 were found to be more pridominent as the % area is more with 27.65%,14.19%,14.03%,13.56%,12.86% respectively. The other peaks were found to be minor as the % area for the peaks were less.

Trace elements analysis in cherangkkottai before and after purification(Sample I&II) was done in ICPOES method, shows the presence of physiological important minerals like calcium, copper, magnesium, manganese, sodium, selenium, molybdenum, phosphorous and

sulphur after purification increased in their level(Table:16).Calcium required for development of bones and teeth, muscle contraction,helps in blood coagulation, nerve transmission. Phosphorous required for the development of bone and teeth. Magnesium is necessary for proper neuromuscular function. Copper is necessary for the synthesis of haemoglobin. Selenium along with Vit E, prevents the development of hepatic necrosis and muscular dystrophy. Potassium are essential to regulate extra cellular fluid and influence cardiac muscle activity. Sodium regulates the body acid base balance. Cobalt is essential component of vitamin B12 and it influences haemopoesis also it maintains normal bone marrow function. Manganese activates several enzymes such as arginase, carboxylase, cholinesterase and chondrial respiratory enzyme system. Sulphur is third most abundant mineral in the body. Sulphur is about half concentrated in your muscles, skin and bones and is essential for life[63]. Sulphur makes up vital amino acids used to create protein for cells and tissues and hormones, enzymes and antibodies[64].So the presence of trace elements in cherangkottai (Semecarpus anacardium dried friut) helps to treat various diseases like carcinoma, Skin diseases&, Vadha diseases**.**

7. SUMMARY

The study drug Cherangkottai(Semecarpus anacardium -dried fruit) was purchased from two different places, one in Country drug shop,Chennai and another in country drug shop, Kanyakumari, and one more sample was obtained from hilly area of Thakalay at Kanyakumari District. Among these three Cherangkottai(Semecarpus anacardium- dried fruit) collected from the hilly area of Thakalay was selected to standardize the before and after purification.

The study drug Cherangkottai(Semecarpus anacardium) was identified and authenticated by based on pharmacognosy report. The pharmacognosy report suggest the test sample was Cherangkottai(Semecarpus anacardium - dried fruit) . And the other herbs used for purification process were identified and authenticated by based on organoleptic, macroscopic & microscopic examination. The study sample Cherangkottai(Semecarpus anacardium - dried fruit) was purified as per Siddha literature, Gunapadam ,Part I,Mooligai vaguppu, Vaithya Rathinam.K.S.Murugesa Mudhalaiyar.

Physicochemical properties of sample I and sample II was analysed , moisture content was reduced after purification than before purification. Slightly changed in pH after purification. Thus revealed the purity, higher stability, long term storage and state of better absorption of purified Cherangkottai(Semecarpus anacardium dried fruit)- (sample II).The phytochemical analysis shows the presence of phenols, flavonoids, quinones, glycosides, aminoacids, carbohydrates and proteins.

The microbial load was analyzed before and after purification of Cherangkottai (Semecarpus anacardium -dried fruit) -sample I and sample II. Total bacterial count and total fungal count, E.coli, Salmonella, Staphylococcus were tested to ensure the safety of the drug in both samples.

Heavy metal analysis was done by AAS method and absence of arsenic, mercury, cadmium, lead was noted in both samples. Pesticides residue and aflatoxin level were quantitatively measured in both the sample I and sample II, the result indicated the absence of them.

The presence of elemental analysis was done by ICPOES method and the results shows the presence of calcium, copper, magnesium, manganese, sulphur, sodium, selenium, molybdenum& phosphorus.

HPTLC analysis was carried out in sample I and sample II. In sample I, 6 major bands at 254 nm and 10 major bands at 366 nm and 5 clear bands in VS reagent. In sample II , 6 major bands at 254 nm and 9 major bands at 366 nm and 6 clear bands in VS reagent.

The HPTLC result shows predominantly five major components at 254 nm in sample I and 4 major components at 254 nm in sample II. Again the HPTLC result shows predominantly 4 major component at 366 nm(absorbent mode) in sample I and 5 major component at 366 nm(absorbent mode) in sample II and in flourescence mode, it showed 4 major component in sample I and 5 major component in sample II

HPTLC analysis was carried out in sample I and sample II. The TLC profile showed 6 major bands under UV 254 nm. 10 major band in UV 366 nm and 5 clear bands after derivatizations in sample II.

HPTLC fingerprinting pattern at 254 of sample II have 10 spots at Rf values, 0.06, 0.11, 0.31, 0.38, 0.49, 059, 0.77, 0.86, 0.and0.96. Rf indicating the occurrence of alteast ten different component in alcoholic extract. It is also clear that out of ten components the component with Rf value o.59,0.96,0.31,0.11 were found to be more predominant as the % area is more with 29.24%,20.75%,12.58%,11.04% respectively .The other peaks were found to be minor as the % area for the peaks was less.

The TLC profile showed 6 major bands under UV 254 nm. 9 major bands UV 366nm and 6 clear bands after derivatizations in sample I.

The HPTLC finger printing pattern at 254 of sample I have 11 spots at Rf value 0.03,0.07,0.09,0.13,0.33,0.47,0.52,0.62,0.80,0.92,and 0.96 Rf values indicates the occurrence of atleast 11 different in alcoholic extract .it is also clear that out of 11 components the components with RF values 0.62,0.33,0.96,0.922, were found to be more predominant as the percentage area is more with 26.95,20.97,20.06,11.54% respectively. The other peaks were found to be minor as the % area for the peaks were less.

The HPTLC fingerprint pattern at 366 nm (absorbent mode) of sample I have 5 spots at Rf value 0.10,0.45,0.52,0.80 ,and 0.94. Rf value indicates the occurrence of atleast 5 different in alcoholic extract. It is also clear that out of 5 components the component with Rf value.0.45,0.52,0.94,0.80,0.10 were found to be more with 29.81,23.55,2 0.90,13.04,12.69 respectively. The other peaks were found to be minor as the % area the peaks were less. The HPTLC fingerprinting pattern at 366nm (absorbent mode)of sample II have 6 spots at Rf value 0.09,0,18,0.40,0.49,0.77&0.93. These Rf values indicates the occurrence of atleast 6 different in alcoholic extract. It is also clear that out of 6 components the component with Rf value 0.49,0.40,0.93,0.09,0.77,were found to be more predominant as the %area is more with 24.50,23.84,16.96,16.21&12.75respectively .The other peaks were found to be minor as the %area for the peaks were less.

The HPTLC finger printing pattern at 366 nm (flouresence mode) of the sample I have 6 spots at Rf value 0.07,0.46,0.50,0.65,0.92,0.97. Rf values indicatses the occurrence of atleast 6 different in alcoholic extract. It is also clear that out of 6 components the component with Rf value 0.46, 0.92,0.65, &0.97, were found to be more predominant as the %area is more with 27.19,25.17,18.55&18.04 respectively .The other peaks were found to be minor as the %area for the peaks were less.

The HPTLC finger printing pattern at 366nm (flouresence model) of sample II have 10 spots at Rf value 0.10,0.06,0.15,0.38,0.48,0.63,0.68,0.71,0.91,0.98 Rf indicates the occurrence of atleast 10 different in alcoholic extract. It is also clear that out of 10 component the component with Rf value 0.01,0.91,0.63,0.48,0.98 were found to be more predominant as the % area is more with 27.65%,14.19%,14.03%,13.56%,12.86% respectively. The other peaks were found to be minor as the % area for the peaks were less.

The HPTLC finger print studies can be used as a diagnostics tool to determine the quality and purity of the drug.

8. CONCLUSION

Based on various analysis before and after purification of Cherangkottai (Semecarpus anacardium –dried fruit) concludes that, purification process of Cherangkottai is important before pharmaceutical preparations.

The physicochemical results of purified Cherangkottai confirmed purity and stability of drug.

The moisture content of purified Cherangkottai is 4.94%. It denotes shelf life of the drug increase after purification as per standard Siddha literature.

P^H of purified Cherangkottai is 5.95.It denotes better absorption of the drug through oral administration.

Heavy metals and Microbial loads are absent in both samples which ensure the safety of the Cherangkottai.

Pesticides and Aflatoxins are absent before and after purification of Cherangkottai which ensure its safety.

Biologically active trace elements like calcium, magnesium, manganese,selenium, copper, molybdenum , sulphur and phosphorus are increase after purification of Cherangkottai.

In HPTLC analysis also shows the concentrations of various components are vary before and after purification of Cherangkottai.

Thus the present study of purification of Cherangkottai reveals, impurities are removed and the quality of the drug is improved. Therefore when a drug is purified and used as medicine will increase the potency and efficacy of the drug.

The achieved results of Pharmacognosy, Physicochemical, Preliminary phytochemical tests, Heavymetal analysis, Microbial load, Pesticide residues, Aflatoxins, TLC profiling and HPTLC fingerprint profiling will be useful as tool for authentication, standardization profile and quality control assessment of the Cherangkottai (Seme carpus anacardium-dried fruit).

9. REFERENCE

1. Kandaswamy pillai, History of Siddha Medicine, Department of Indian Medicine and Homeopathy,Chennai-106, 1998, Page no: 1,2,42.
2. Principals of Diagnosis in Siddha , Department of Indian Medicine and Homeopathy, First edition 2009, Page no: 11 -12.
3. Dr.R.Thiyagarajan, Siddha Maruthuvam Sirappu , Department of Indian Medicine and Homeopathy, Chennai , 2nd d edition1995, Page no: 3.
4. The wealth of India, National Institute of Science Communication and Information Resources, New Delhi, Vol -1, 2004, Page no: 1,121.
5. Mugamathu Icbal, Sattam Saarntha Maruthuvam, Indian Medicine and Homeopathy Department, Chennai -106, 2002, Page no: 564.
6. Murugesa Mudhaliyar, Gunapadam mooligai vakupu, Department of Indian medicine and Homeopathy, Chennai, 7th edition, 2003, Page no: 488-490,644-646,696-699&270-272.
7. http://en.wikipedia .org/wiki/list of purification methods in chemistry.04.06.17,5.00PM
8. Lester packer, Herbal and traditional medicine, Marcel decker pvt lmt, 2014 , page no :888- 891
9. http://en.wikipedia .org/wiki/standardization.6.06.17,4.30PM.
10. Quality Standards of Indian Medicinal plantsIndian council of medical research,New Delhi, Vol 1,9, 2003, Page no:311-491, 40-41
11. Sharma A, Mathur R, Dixit VP, Hypocholesterolemic activity of nut shell extract of *Semecarpus anacardium* (Bhilawa) in cholesterol fed rabbits. Indian J Exp Biol. 1995;33: Page no: 444–448.
12. Ramprasath VR, Shanthi P, Sachdanandam P, Immunomodulatory and anti inflammatory effects of *Semecarpus anacardium* LINN, Nut milk extract in experimental inflammatory conditions, Biol Pharm Bull. 2006; 29: Page no: 693–700.
13. Selvam C, Jachak SM. A cyclooxygenase (COX) inhibitory biflavonoid from the seeds of *Semecarpus anacardium*. J Ethnopharmacol. 2004;95: Page no: 209–12.
14. Bhitre MJ, Patil S, Kataria M, Anwikar S, Kadri H. Antiinflammatory activity of the fruits of *Semecarpus anacardium* Linn. Asian J Chem. 2008;20: Page no: 2047–50.

15. Satyavati GV, Prasad DN, Das PK, Singh HD, Antiinflammatory activity of *Semecarpus anacardium* Linn.A preliminary study. Indian J Physiol Pharmacol. 1969;13: Page no: 37–45.

16. Singh D, Aggarwal A, Mathias A, Naik S. Immunomodulatory activity of Semecarpus anacardium extract in mononuclear cells of normal individuals and rheumatoid arthritis patients. J Ethnopharmacol. 2006; 108: page no: 398–406.

17. Premalatha B, Sachdanandam P. Potency of *Semecarpus anacardium* Linn. Nut milk extract against aflatoxin B(1)-induced hepatocarcinogenesis: Reflection on microsomal biotransformation. Pharmacol Res. 2000; 42 page no: 161–6.

18. Ramprasath VR, Shanthi P, Sachdanandam P, Semecarpus anacardium Linn.Nut milk extract, an indigenous drug preparation, modulates reactive oxygen/nitrogen species levels and antioxidative system in adjuvant arthritic rats. Mol Cell Biochem. 2005; 276 page no: 97–104.

19. Mythilypriya R, Shanthi P, Sachdanandam P, Therapeutic effect of Kalpaamruthaa, a herbal preparation on adjuvant induced arthritis in wistar rats, Inflammo pharmacology. 2008; 16 page no: 21–35.

20. Verma N, Vinayak M, Bioscience Reports Immediate Publication; 2008. Page no:19

21. Sahoo AK, Narayanana N, Sahanaa S, Rajanb SS, Mukherjee PK, In vitro antioxidant potential of *Semecarpus Anacardium* L. Pharmacologyonline 2008;3:Page no:327–35.

22. Farooq SM, Alla TR, Rao NV, Prasad K, Shalam K, Satyanarayana S. A study on CNS effect of nut milk extract of *Semicarpus anacardium*. Pharmacologyonline. 2007;1, Page no. 49–63.

23. Mohanta TK, Patra JK, Rath SK, Pal DK, Thatoi HN. Evaluation of antimicrobial activity and phytochemical screening of oils and nuts of *Semecarpus anacardium*. Sci Res Essay. 2007;2:.4 Page no. 86–90.

24. Nair A, Bhide SV. Antimicrobial properties of different parts of *Semecarpus anacardium*. Indian Drugs. 1996; 33: Page no.323–8.

25. Arul B, Kothai R, Christina AJ. Hypoglycemic and antihyperglycemiceffect of Semecarpus anacardium Linn in normal and streptozotocin-induced diabetic rats. Methods Find Exp Clin Pharmacol. 2004; 26: Page no. 759–62.

26. Veena K, Shanthi P, Sachdanandam P, The biochemical alterations following administration of Kalpaamruthaa and Semecarpus anacardium in mammary carcinoma. Chem Biol Interact. 2006;. Page no. 161:69–78.

27. Mathivadhani P, Shanthi P, Sachdanandam P. Apoptotic effect of Semecarpus anacardium nut extract on T47D breast cancer cell line. Cell Biol Int. 2007; 31:Page no: 1198–206.

28. Arulkumaran S, Ramprasath VR, Shanthi P, Sachdanandam P. Alteration of DMBA-induced oxidative stress by additive action of a modified indigenous preparation - Kalpaamruthaa. Chem Biol Interact. 2007.1 Page no: 67, 99–106.

29. Sugapriya D, Shanthi P, S achdanandam P,Restoration of energy metabolism ineukemic mice treated by a siddha drug: Semecarpus anacardium Linn.nut milk extract. Chem Biol Interact. 2008;17 Page no: 3:43–58.

30. Choudhari CV, Deshmukh PB, Acute and subchronic toxicity study of *Semecarpus anacardium* on heamoglobin percent and R.B.C. count of male albino rat. J. Herb Med Toxicol. 2007; 1: Page no: 43–5.

31. Prabhu D, Rajwani LS, Desai PV, The antimutagenic effect of *Semecarpus anacardium* under in vivo condition. Asian J Chem. 2005 ; 12: page no.13–6.

32. Krishnarajua AV, Rao TV, Sundararajua D, Vanisreeb M. Assessment of bioactivityof Indian medicinal plants using brine shrimp (*Artemia salina*) lethality assay. Int J Appl. Sci Eng. 2005; 3: page no.125–34

33. Pulipaani vaithiyam-500, Thamarai noolagam, edition 1999. Page no 72,65,64.

34. Siddha Vaithiya thirattu, Indian medicine and homeopathy ,Chennai. 1998,Page no: 247,338.

35. Bogar vaithiyam 700, Thamarai noolagam, edition 1933. Page no: 332.

36. Theraiyar thaila vargam, Thamari noolagam, edition 2007. Page no: 100, 50.

37. Theraiyar vaithiya kaaviyam(2013), Olai chuvadi pathipagam, Page no. 60

38. Anuboga vaithiya Navaneetham, Thamarai Noolagam, vol-5, Page no:148.

39. Bramma Muni karukadai choothiram-380, Thamari noolagam edition 1998 , Page no: 41,525.

40. Aaathma Rakcha Mirthamennum Vaithiya Saarasangragam, Kandasamy Mudhaliyar, Sri shenbaga Pathipagam, edition 2011, Page no: 501 &506.

41. Sikicha ratha deepam, B-Rathinam nayakar and Sons Kannu Samy pillai, edition 2007, Page no: 220&226.

42. Kannusamy Parambarai Vaithyam, B-Rathinam Nayakar and Sons,Chennai-79, edition 1948, Page no:226.

43. Agathiyar vaithiyam vallathy-600, Thamarai Noolagam, edition 2001, Page no: 6, 12, 14&36.

44. Anuboga Vaithiya Navaneetham, Thamarai Noolagam, vol-8, Page no: 88, 83, 90, 93, 94, 97, 101&102.

45. Anuboga vaithiya Navaneetham, Thamarai Noolagam, vol- 9, Page no: 81,93.

46. Nadkarni (2003), Indian materia medical; Bombay Popular Prakasam, vol -1, 3rd edition, Page no: 1191&222.

47. Review on Indian Medicinal Plants, Indian Council of Medical Research, New Delhi - 2004,Vol-4 ,Page no :99.

48. Thiyagarayan , Gunapadam Thathu Seeva Vaguppu, Indian Medicine and Homeopathy Chennai, 7th edition, 2003, Page no: 649& 650.

49. http;//en-wikipedia. Org/wiki/cow dung uses, 03.04.17, 4.00PM.

50. Dr. Pulok K. Mukherjee, quality control herbal drugs, Business, Horizons, New Delhi, 1st edition, Page no: 8

51. Hakim Mohammed Sahib, Raja Vaidhyamentrum Theraiyar Arulicheitha Yemaga Venba, Indian Medicine and Homeopathy. Page no: 122-251.

52. Deva asirvadha Samuel, Marunthu Chei Iyalum Kalaiyum, Indian Medicine and Homeopathy, Page no: 287.

53. B.Devi, et al, Comparative analysis of Vengaram (borax) by different purification methods. International journal of pharmacy and pharmaceutical research, 2012,Page no :320-323.

54. Dr.Jijimol. V.C, Standardization on purification process of Nabhi, page no: 78.

55. Indian Pharmacopoeia, Department of AYUSH, Volume 2, edition 2014. Page no: 169, 98, 162 & 277.

56. Padmaja Udayakumar, Medical Pharmacology, CBS Publishers and Distributor's pvt ltd, 4th edition, 2013, Page no: 14

57. http://en.wikepedca. Org/wike/phyto chemical, 29.06.17, 1.54 PM.

58. Herbal Drug Quality and Chemistry, D.D Joshi edition 2011, Page no: 93, 95, 71& 73.

59. Ambika Shanmugam, Fundamental of Biochemistry, 7th edition, Page no: 661& 679.

60. Quality Control Methods for Medicinal Plants WHO guidelines, A.I.T.B.S Publishes and Distributors, edition 2002, Page no: 226.

61. The Esentials of Medicine and Toxicology, Dr. K. S Narayan Reddy, edition 24th -2005, Page no: 546.

62. Jemilat. A. Ibrahim, et .al, Pharmacognostic, Physic chemical standardization and phytochemical Analyses of leaves of cultivated crotalaria cachnsema stapf. Journal of applied pharmaceutical science, 2012; 2(9). Page no: 67-70.

63. Anonymous, The Siddha Formulary of India, Ministry of Health & Family Welfare, New Delhi, Part I, 1992: 1st edition, Page no: 183-200.

64. Dr. Sathynarayanan and Dr. Chakrapani, Biochemistry, Books and Allied (p) Ltd, 3rd edition, 2006, Page no: 405, 404, and 416.

65. DM. Vasudevan Sree kumari. S, Biochemistry, 5th edition. Page no: 322.

10.ANNEXURE

10.1. Equal Measurement for Siddha Formulary Dosage mentioned in Literature Review.

10.2. Authentication Certificates

10.3. Research Methodology and Biostatistics participated Certificate.

` **10.1. Equal measurement for Siddha formulary Dosage mentioned in Litrature review**

1. Kasu edai - 800 mg
2. Kundri - 130 mg
3. Karandi - 1.33 ml
4. Kottaipakalavu - 5-8 gm
5. Nellikai alavu - 15 gm
6. Verukadi - 1.5 gm
7. Palam - 35 gm
8. Varagan - 4.16 gm

CHERANGKOTTAI(Semecarpus anacardium-Dried fruit)

–BEFORE PURIFICATION

CHERANGKOTTAI (Semecarpus anacardium-Dried fruit)

–AFTER PURIFICATION

CRUSHED CHERANGKOTTAI

(Semecarpus anacardium- Dried fruit)

–BEFORE PURIFICATION

CRUSHED CHERANGKOTTAI

(Semecarpus anacardium- Dried fruit)

–AFTER PURIFICATION

INGREDIENTS USED TO PURIFICATION OF CHERANGKOTTAI (Semecarpus anacardium-Dried fruit)

1. PULI ILAI (Leaf of Tamarindus indica)

2.PURASU POO (Flower of Butea monosperma)

INGREDIENTS USED TO PURIFICATION OF CHERANGKOTTAI (Semecarpus anacardium-Dried fruit)

3. MATTU SANAM(COW DUNG)

4.KATRALAZHAI(Aloe vera)

NATIONAL INSTITUTE OF SIDDHA, CHENNAI – 600047

BOTANICAL CERTIFICATE

Certified that the following plant drug taken up for Post Graduation Dissertation studies by **Dr.S.Sujitha**, M.D.(S), II year of Department of Nanju Nool and Maruthuva Neethi Nool, 2016, are identified through Visual inspection, Experience, Education & Training, Organoleptic characters, Morphology, Micromorphology and Taxonomical methods as

Semecarpus anacardium Linn.f. (Anacardiaceae), Nut

MEDICINAL BOTANY ★ CHENNAI 600 047 ★ National Institute of Siddha

Certificate No: NISMB2402016

Date: 18-7-2016

Authorized Signatory

Dr. D. ARAVIND, M.D.(s),M.Sc.,
Assistant Professor
Department of Medicinal Botany
National Institute of Siddha
Chennai - 600 047. INDIA

INSTITUTE OF HERBAL SCIENCE
PLANT ANATOMY RESEARCH CENTRE

Prof.**P Jayaraman, Ph.D**
Director
Retd, Professor, Presidency College Chennai-5

AUTHENTICATION CERTIFICATE

Based upon the Organoleptic ✓ /macroscopic ✓ /microscopic ✓ examination of ~~fresh~~ /market ✓

sample, it is certified that the specimen given by Dr. Sujitha, M.D(S), III yr. Dept. of Nanju Nool & Maruthuva Neethi Nool, Nat. Inst. of Siddha, Chennai. is identified as below:

Binomial: Semecarpus anacardium L. var. anacardium Wight

Family: Anacardiaceae

Synonym(s): —

Regional names: Shenkottai

Reg.No of the certificate: PARC/2017/3327

References: Nair, N.C & Henry, A.N. Flora of TamilNadu, India I: p. 89 .1983. ✓

Henry, A.N. *et al.* Ibid. — II: — .1987.

Ibid. — III: — .1989.

Ed:S.P.Ambasta,
The Useful Plants of India,
CSIR- Publication, 1986.

Date: 04.01.2017

(Prof.P.JAYARAMAN)

Prof.P.Jayaraman,Ph.D.
Director,
Institute of Herbal Botany
PLANT ANATOMY RESEARCH CENTRE,
No.4-II Street,Sakthi Nagar,
West Tambaram,Chennai-45.
Ph:044-22263236, Cell:9939136959
E-mail:herbalparc@yahoo.com

#4,2nd Street, Sakthi Nagar,
West Tambaram, Chennai-600 045
Ph:044-22263236,+919444385098
Email- herbalparc@yahoo.com

INSTITUTE OF HERBAL SCIENCE
PLANT ANATOMY RESEARCH CENTRE

Prof.**P Jayaraman, Ph.D**
Director
Retd, Professor, Presidency College Chennai-5

AUTHENTICATION CERTIFICATE

Based upon the Organoleptic /macroscopic /~~microscopic~~ examination of fresh /~~market~~ sample, it is certified that the specimen given by Dr.S.Sujitha, MD(S), III year, Dept of Nanju Nool and Maruthuva neethi Nool, National institute of Siddha, Chennai. is identified as below:

Binomial: Aloe vera (L.) Burm.f.

Family: Liliaceae

Synonym(s): A. barbadensis Mill.

Regional names: Tamil:- chotthu kathalai.

Reg.No of the certificate: PARC/2017/3469

References: Nair, N.C & Henry, A.N. Flora of TamilNadu, India I: ——— .1983.

Henry, A.N. *et al.* Ibid. ——— II: ——— .1987.

Ibid. ——— III: Pg: 37 .1989.✓

Ed:S.P.Ambasta,
The Useful Plants of India,
CSIR- Publication, 1986.

Date: 08.2.2017

(Prof.P.JAYARAMAN)

Prof.P.Jayaraman,Ph.D.
Director,
Institute of Herbal Botany
PLANT ANATOMY RESEARCH CENTRE,
No.4-II Street,Sakthi Nagar,
West Tambaram,Chennai-45.
Ph:044-22265236; Cell:9939136959
E-mail:herbalparc@yahoo.com

#4,2nd Street, Sakthi Nagar,
West Tambaram, Chennai-600 045
Ph:044-22263236,+919444385098
Email- herbalparc@yahoo.com

INSTITUTE OF HERBAL SCIENCE
PLANT ANATOMY RESEARCH CENTRE

Prof.**P Jayaraman, Ph.D**
Director
Retd, Professor, Presidency College Chennai-5

AUTHENTICATION CERTIFICATE

Based upon the Organoleptic /macroscopic /~~microscopic~~ examination of fresh /~~market~~ sample, it is certified that the specimen given by Dr. S. Sujitha, MD(S), III year, Dept of Nanju Nool and Maruthuva Neethi Nool, National Institute of Siddha, Chennai. is identified as below:

Binomial: Tamarindus indica L.

Family: Caesalpiniaceae

Synonym(s): —

Regional names: Tamil:- Puli.

Reg.No of the certificate: PARC/2017/3471

References: Nair, N.C & Henry, A.N. Flora of TamilNadu, India I: Pg: 133 .1983.

Henry, A.N. *et al.* Ibid. II: .1987.

Ibid. III: .1989.

Ed:S.P.Ambasta,
The Useful Plants of India,
CSIR- Publication, 1986.

Date: 08.02.2017

(Prof.P.JAYARAMAN)

Prof.P.Jayaraman,Ph.D.
Director,
Institute of Herbal Botany
PLANT ANATOMY RESEARCH CENTRE.
No.4-II Street,Sakthi Nagar,
West Tambaram,Chennai-45.
Ph:044-22263236, Cell:9939136959
E-mail:herbalparc@yahoo.com

#4,2nd Street, Sakthi Nagar,
West Tambaram, Chennai-600 045
Ph:044-22263236,+919444385098
Email- herbalparc@yahoo.com

Tha Tamil Nadu Dr.M.G.R.Medical University

69,Anna Salai,Guindy,Chennai - 600 032.

This Certificate is awarded to Dr/~~Mr/Mrs~~.....S. Sujitha.....

for participating as ~~Resource Person~~ / Delegate in the Seventeenth (XVII) Workshop on

" RESEARCH METHODOLOGY & BIOSTATISTICS "

FOR AYUSH POST GRADUATES & RESEARCHERS

Organized by the Department of Siddha

The Tamil Nadu Dr. M.G.R. Medical University from 15th to 19th June 2015.

Dr.N.KABILAN, M.D.(Siddha)
READER,DEPT.OF SIDDHA

Prof. **Dr.P.ARUMUGAM,** M.D.,
REGISTRAR i/c

Prof. **Dr.D.SHANTHARAM,** M.D., D.Diab.,
VICE - CHANCELLOR